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ABSTRACT

This volume is the edited transcript of the tape-recorded symposium of archivists, manuscript curators, librarians, and historical agency administrators, which was held at Drake Univrsity in the fall of 1978. The papers presented are "The Law and Public Records: The Iowa Context" by Peter T. Harstad; "Being Selective: What to Collect and Preserve" by George Talbot; and "Preservation of Black and White Photographs" and "Stability and Preservation of Color Photographs," both by Henry Wilhelm. Separate panels conducted by George Cunha and others consider "Where to Do It? A Panel Discussion on Regional, State, and In-House Conservation" and "How to Do It? A Panel Discussion on Do-It-Yourself Conservation Techniques." Appendices include information on examination of Iowa public records, sources of preservation supplies, current color processes, recommended color print materials and limits of color print image deterioration, and storage of color materials. (Author/RAA)

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PRESERVING YOUR HISTORICAL RECORDS

Proceedings of the Symposium Held at Drake University

October 20-21, 1978

Edited by Toby Fishbein and Alan F. Perry

Assisted by Jon Reynolds

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INTRODUCTION

In October 1978 over 120 archivists, manuscript curators, librarians and historical agency administrators gathered at Drake University in Des Moines, Iowa, to attend a two day symposium on conserving historical records. Four organizations cooperated in sponsoring the affair: the Iowa Historical Materials Preservation Society, the Kansas City Federal Archives and Records Center (part of the National Archives and Records Service), the College of Continuing Education of Drake University and the Iowa Local Historical and Museum Association.

We feel that the resulting papers, panel discussions, questions and answers were interesting enough to warrant publication in this form; subsequent inquiries from attendees and persons who had heard of the symposium but were unable to attend would seem to bear out this judgment. The gathering was a regional affair in that it drew chiefly on the northern midwest of the United States for its attendance, but many of the speakers and panelists are of some national note and the problems we dealt with are of concern wherever there are conscientious curators of a documentary heritage.

We restricted the scope of the symposium to paper and photographic records. This was not through any misapprehension of the increasing importance of documents found on such mediums as magnetic tape, audiodiscs or (soon) videodiscs; it reflects, rather, the fact that the great bulk of records in the care of most historical agencies are still on those traditional mediums. As most people have expressed concern for their paper and photograph conservation difficulties, we decided to address only these aspects in the limited time available.

The proceedings were tape recorded; this publication is an edited transcription of what was actually said at the symposium. The reader should bear in mind that none of the papers were prepared with the anticipation that they would eventually be printed and that the "How to Do It" panel did not call for prepared talks at all. The papers were intended for oral delivery rather than for printing and we did not ask the participants to completely rework their contributions for publication. Instead, we chose to maintain as far as possible the spontaneous flavor of what went on at the symposium. We and the participants edited and reworked what was on the tapes only to the extent necessary to tidy up syntax, clarify an occasional obscure point, eliminate false starts and add such necessary elements as section breaks and footnotes. A few statements were deleted by participants as unsuitable for publication.

Editorial duties were shared equally by the editors, who also transcribed four of the six sessions. Jon Reynolds, University Archivist of Georgetown University, transcribed and undertook the preliminary editing of the two Wilhelm sessions.

We regret that there is no way to convey any part of the "hands on" portion of the gathering. It is also a pity that we could not

afford to reproduce most of the slides used to illustrate George Talbot's and Henry Wilhelm's papers. They have selected a few of the most telling examples for reproduction; we hope the reader will bear with the occasional allusion to something that was flashed on the auditorium screen but could not be included in this publication. We have tried to edit around those slides that could not be included. George Talbot, in particular, had to undertake the most substantial revision of all the participants to allow for his original reliance on slides and we are grateful for his willingness to do so.

It is pleasant to be able to gratefully acknowledge the contributions of several persons and institutions to the success of the symposium and to this publication. Without the ability of J. Patrick Wildenberg of the Herbert Hoover Presidential Library to coax balky recording machinery into productivity, there would have been no tapes from which to transcribe these proceedings. Reed Whitaker, Archives Branch Chief of the Kansas City Federal Archives and Records Center, provided essential advice and encouragement throughout. Loren Horton of the State Historical Society of Iowa was always helpful. Charles P. Bennett, President of the Iowa Local Historical and Museum Association, was generous with his assistance. The Kansas City Federal Archives and Records Center provided postage, staff time and program printing services; the Iowa Historical Materials Preservation Society conceived the idea for the symposium and supported it throughout.

Above all, any such gathering depends on the quality and enthusiasm of its participants. With the exception of Robert MacClaren (who was funded by his institution), all speakers and panelists provided their own transportation. They all lived up to their fine reputations and rolled up their sleeves to toil over their "hands on" demonstrations. We were fortunate indeed.

Typing of these proceedings was made possible by a grant from the Iowa State University Graduate College. Karen Hethcote did an excellent job with the often confusing drafts from which she had to work. The printing was funded by the Kansas City Federal Archives and Records Center.

The statements made are exclusively those of the speakers; the editors and the four sponsoring institutions can accept no responsibility for them. We are confident, however, that they will prove interesting and useful to the growing community of persons interested in the conservation of manuscript and photographic documents.

Toby Fishbein, University Archivist, Iowa State University

Alan F. Perry, Archivist, Kansas City Federal Archives and Records Center

July 1980

THE PARTICIPANTS

GEORGE M. CUNHA studied chemistry at MIT and worked as a chemist at the Cambridge Rubber Company in Massachusetts. He joined the Navy before World War II and retired at the rank of Captain. Since leaving the Navy, he has served as Conservator of Rare Books, Documents, Maps and Works of Art on Paper at the Boston Athenaeum and worked as a free-lance paper conservation consultant. He became the Director of the recently established New England Document Conservation Center in 1973 and is now its Director Emeritus. He has published and edited in the field of paper conservation, including co-authoring the two volumes of Conservation of Library Materials. He is a fellow of the Royal Society of Arts and of the American Institute for Conservation and a member of other professional societies.

JACQUELINE HARING has been, among other things, a university administrator, a wartime Red Cross worker and an employee of the National Security Council. She studied at Vassar, received her degree from the University of Michigan and studied archives administration under T.R. Schellenberg. Since 1965 she has been Curator of Archives, Art and Manuscript Collections at Knox College in Galesburg, Illinois. She is active in such professional societies as the Midwest Archives Conference (which she served as President), the Society of American Archivists and the American Museum Association.

PETER T. HARSTAD has been the Director of the State Historical Society of Iowa since 1972. A native of Madison, Wisconsin, he was educated at Bethany College and the University of Wisconsin. He earned a master's degree in 1959 and a doctorate in 1963. He began his professional career as a high school teacher, later becoming a history professor at Idaho State University. He has written extensively on the history of Idaho, Iowa and Wisconsin and is a member of numerous professional organizations, including the Iowa Historical Materials Preservation Society, the Organization of American Historians and the American Association for State and Local History.

BETTY HILL came to her present position as Conservator at the Illinois State Archives from a varied background. She sold real estate and was a Sangamon County (Illinois) social worker. In 1967 she became an archival apprentice at the Illinois State Archives.

ROBERT MacCLAREN is the Chief Chemist at the National Archives and Records Service in Washington, D.C. After graduating from the University of Michigan with a master's degree in chemical engineering, he worked for Eastman Kodak as Director of Pulp and Paper Research and for the Xerox Corporation as its international design authority. He is currently the technical representative of the Society of American Archivists with the American National Standards Institute and is a member of the Society of American Archivists and other professional organizations.

JOHN J. NEWMAN earned a bachelor's degree from Marquette University and a master's degree in history from Indiana University. He taught in the public schools of Wisconsin and Indiana and was named Archivist of the State of Indiana in 1970. He has written technical manuals of interest to archivists and historians and has served as President of the Society of Indiana Archivists. The Society of American Archivists, the Midwest Archives Conference and the American Association for State and Local History are among his other professional associations. When the State Archives was made a part of the Commission on Public Records and Archives in 1979, he was appointed Deputy Director.

RICHARD D. SMITH is best known as the inventor of the Wei T'o deacidification sprays and solutions. His bachelor of science degree was earned at Pennsylvania State University in 1952, his master's degree was granted by the University of Denver in 1964 and in 1970 he completed his doctorate at the University of Chicago. He is a registered professional engineer and author of many articles on the deterioration and preservation of paper. He currently serves as an instructor at the University of Chicago Graduate Library School, consultant to the Public Archives of Canada, associate editor of Restorator: International Journal for the Preservation of Archival and Library Material and President of Wei T'o Associates, Inc., of Park Forest, Illinois.

GEORGE TALBOT taught sociology and anthropology at the University of Illinois, Washington University (St. Louis) and Rutgers and worked in university theatre, film and television as a set designer, producer and film maker. He also served as art and photography director and anthropology editor of Trans-Action magazine and has edited, given workshops and produced exhibitions in the fields of decorative arts, historical photography, communications and anthropology. He earned a bachelor's degree in 1950 and a master's degree in 1956 from the University of Chicago. He has been the Curator of Visual and Recorded Sound Archives at the State Historical Society of Wisconsin since 1972.

HENRY WILHELM served in the Peace Corps and returned to the United States to attend Grinnell College in Iowa. In 1967, while at Grinnell, he founded the East Street Gallery as a gallery and photography teaching workshop. He has published several articles on photographic conservation and in 1967 started production of his patented photographic print washer, a business which continued until 1978. He is the co-author, with Klaus B. Hendriks, of The History and Preservation of Contemporary Photographic Materials (forthcoming).

THE LAW AND PUBLIC RECORDS: THE IOWA CONTEXT

by Peter T. Harstad

Before I launch into the body of my text, I would like to acknowledge two people who helped supply me with information. They are Alan Perry, whom you have seen buzzing around the room and will be introduced, I hope, with due flair as the conference progresses, and Mark Jones of our staff at the State Historical Society of Iowa.

My talk is divided into three parts, the first of which has to do with the Census.

I

As early as three thousand years before the reign of Caesar Augustus, governments were collecting information about people and were recording this information on tax, muster and census rolls. But the collection of detailed information on general populations is really a relatively recent phenomenon; in fact, almost a Twentieth Century phenomenon. Potentates of the past did not lack curiosity about their subjects; their clerks simply had difficulty controlling large masses of data, preparing meaningful reports based upon hundreds of thousands of bits of information, or retrieving a desired detail in time to be useful. The latter point is the most telling: getting the needed data back in time to be useful. The most impressive data gathering achievement of the Middle Ages, William the Conqueror's Domesday Book of 1086, consists of but two volumes of facts about people and property in some (but not all) counties of England following the Norman conquest.

If monarchs have shown their vanity in their recordkeeping, the American democracy has shown its practicality, its ingenuity and, possibly, its narcissism. Twentieth Century bureaucracy is able to generate and store useful information in large quantities and retrieve desired detail in a fraction of a second. Thus, there is reason to be concerned about the law and public records as never before.

A brief look at developments in the Census Bureau during the closing years of the Nineteenth Century provides some perspective. Besides, when the Kansas City Federal Archives and Records Center, the University of Iowa and my own institution sponsored a symposium back in 1973 in Iowa, the prevailing theme was the Census. So, in a sense, what I am doing here, then, is picking up where we left off five years ago, when we were so rudely interrupted.

In the 1880's, Alexander Graham Bell got the idea of using census data in research that he was then conducting on the relationship between heredity and the incidence of deafness. He went to the Patent Office where the original federal census documents, going back to 1790, were stored. Here he found the population schedules unused and in almost total disarray; he also learned of plans to dispose of the main body of these materials as scrap paper. On

the positive side, from the researcher's point of view, Bell found no legal or administrative obstacles in the way of his free use of the Census data.

Bell and other scholars badgered decision-makers on two fronts: first, the original Census schedules should be kept and second, more detail should be included in decennial censuses taken in the future. Success came on both fronts. Further, nationalistic politicians could readily see that the Census could assert America's status as an emerging world power, which it certainly was at the turn of the century. To cope with mounting detail, the Census Bureau employed machine tabulation for the first time in the preparation of the 1890 Census. Bell offered a machine to sort punch-coded census cards, but instead, the Census Bureau acquired an electronic punch-card tabulating system, recently developed by Herman Hollerith. Through to the end of the Nineteenth Century, the Census Bureau allowed complete and immediate access to the entire mass of data under its jurisdiction.[1]

In his address to Congress of December 5, 1899, President William McKinley asserted: "The provision for securing a proper enumeration of the population, as well as to secure evidence of the industrial growth of the Nation, is broader and more comprehensive than any similar legislation in the past....It is believed that the Twelfth Census will emphasize our remarkable advance in all that pertains to national progress."[2] Notice the nationalism running through the statement. To gear up for handling the data, Bell developed for the Census Bureau an adaptation of the Hollerith machine which allowed for electronic enumeration of data without the necessity of first sorting the data cards. More important for us, for the first time in the history of the Nation, the Census Bureau made a distinction between the individual citizen's right to privacy and the public right to know. Only aggregate information resulting from the tabulations was to be released to the public.

Historians with a bent toward quantification and genealogists know well the consequences of the decisions made at the turn of the century regarding access to the census schedules. Only within the last few months has the National Archives and Records Service been able to sell microfilm copies of the population schedules of the 1900

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1. Articles on Bell and Hollerith in Dictionary of American Biography. Hollerith is better known as one of the founding fathers of IBM. See also Robert V. Bruce, "Alexander Graham Bell and the Conquest of Solitude" in Regulations For Use and Transfer of Population Census Records to National Archives, Hearing Before the Subcommittee on Census and Population of the Committee on Post Office And Civil Service, House of Representatives, Ninety-Fourth Congress First Session on H.R. 10686, Serial No. 94-50 (Washington, 1975), pp. 10-17. Hereafter cited as Census Hearing (1975).

2. James D. Richardson, A Supplement to A Compilation of the Messages and Papers of the Presidents, 1789-1902 (New York, 1903), p. 86.

Census (although researchers have been able to use these schedules at the National Archives since late 1973) and some copies were released and studied between 1973 and the beginning of 1978.

Confidentiality was not promised categorically in the taking of the 1900 Census. However, beginning with President William Howard Taft's proclamation concerning the taking of the Thirteenth Decennial Census, American presidents have given such pledges and these have been backed up in federal laws of increasing strictness as the century has progressed. I will read a little section out of President Taft's proclamation: "The sole purpose of the census is to secure general statistical information regarding the population and resources of the country, and replies are required from individuals only in order to permit the compilation of such general statistics." Later in the proclamation he asserted: "...every employee of the Census Bureau is prohibited, under heavy penalty, from disclosing any information [about individual persons] which may thus come to his knowledge.[3] So here we see a very definite change.

This leads to a point that I would like to clinch very early in my presentation today. Some of the most important decisions relevant to the use of public records in the United States, as well as in states such as Iowa (which we will begin bearing down upon soon), did not grow out of law but out of pledges of government officials or practices and rules in various departments of government. Some of these eventually grew into laws, but many of them did not start out as laws. They just evolved until they were eventually solidified into laws. One of the knottiest problems confronting archivists of public records is how long record series are to be administered under terms stipulated by the agency that generated them. This is a problem with which all of us in public records administration have to deal. Here, recent experience suggests that archivists tend to get more sympathy from the general public in opening up records than from the bureaucrats who do not have archival experience. I will illustrate this point in just a few minutes.

The National Archives has made peace with the Census Bureau on the following terms, as explained by Acting Archivist of the United States James E. O'Neill in 1975: "Shortly after the National Archives was established and population census schedules transferred to the Archives, the Director of the Bureau of the Census and the Archivist of the United States agreed that early population census records, 1790 to 1870, would be open to all researchers immediately. The 1870 census records were made available when they were transferred to the Archives in 1942, seventy-two years after the census was taken. This established the 72-year precedent for restrictions on population census records."[4] Watch that year, that time of seventy-two

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3. Quoted in Census Hearing (1975), pp. 35-36.

4. "Statement of James E. O'Neill . . . " in Census Hearing (1975), p. 20.

years. I do not think anybody thought very seriously about that number of years. It just happened. Following in this tradition, the 1880 Census returns were made available in 1952 and the few 1890 Census returns that survived a devastating fire in Washington in 1921 were released in 1962. As 1972 approached, the Census Bureau balked at opening the 1900 Census because of the legal terms under which it was taken. I believe I am correct in asserting that it took an act of Congress to make the 1900 Census fully and completely open and to allow the sale and distribution of microfilm copies of the population schedules. This was a matter of much concern five years ago to the authorities of the Archives.

Acting Archivist of the United States O'Neill got down to basics in congressional testimony three years ago when he asserted that the fundamental issue of access to government records such as the Census data "is less legal than philosophical". He then followed out a line of reasoning that "there is very rarely any reason, other than the protection of individual rights, that should be used to deny citizens access to Federal records created more than a half-century ago." Here he referred to the Federal Records Act of 1950, which would hold a fifty-year limit on access to records of executive agencies unless the Archivist of the United States determines that restrictions should remain in force longer. Generally, the Archivist extends to "75 years the restriction on records containing information about individuals," particularly information about "physical or mental health, or the medical or psychiatric care or treatment of individuals, or relating to the investigation of individuals."[5]

Now, to the best of my knowledge, the foregoing still reflects the most generally applicable laws and policies governing the National Archives, with the following notable exceptions: the Privacy Act of 1974 and the Family Educational Rights and Privacy Act of the same year. These two pieces of legislation have complicated the lives of archivists quite a bit, but probably for the public good. Those who would desire to know more about these matters should consult publications such as Basic Laws and Authorities of the National Archives and Records Service or General Restrictions on Access to Records in the National Archives or Regulations for the Public Use of Records in the National Archives and Records Service.[6]

I do not want to launch further into this subject; one would almost have to be concerned with a particular batch of records to know whether or not it is open and under what terms. It is a very complicated business.

Before we entirely abandon the subject of the federal census, it may be of interest to those of us who administer public records to know what objections have been raised by citizens to disclosure of

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5. Ibid., pp. 22-23.

6. These are available from the Publications Sales Branch, National Archives Building, Washington, D.C., 20408.

census data after the passage of seventy-two years. We get some rather startling evidence here. Vincent P. Barabba, Director of the Census Bureau and a foe of the Archives' allegedly "lenient" policies, was asked, while testifying before a congressional committee in 1975, if there were any objections to opening census data after seventy-two years. He replied that he knew of no objections registered to the opening of the 1900 Census--not a single one; but he was aware of a case relative to the 1880 Census "in which the census record of an individual in the State of Louisiana was used to demonstrate that that individual was not of the white race. And it was to her detriment."[7] This was the only piece of evidence Barabba and other members of his staff who were testifying were able to offer to Congress.

Let us turn to the State of Iowa and see if we can get some perspective on similar issues. The State of Iowa has had experience in the administration of census data of 1925 vintage. That is the latest Iowa census. As far as we can ascertain, the detailed population schedules have never been officially closed since the day they were prepared. The 1925 Census is available at the Division of Historical Museum and Archives in Des Moines and, thanks in part to a National Historical Publications and Records Commission grant, it is also available on microfilm at the Division of the State Historical Society in Iowa City (my institution). Neither Jack Musgrove, administrator of the first mentioned institution, nor myself, administrator of the second, know of objections on the part of citizens to the free dissemination of information from the 1925 Census. Nothing has been brought to our attention at all. This information is very detailed both about one's personal life and also about economic issues. No problems have come up that we know of. I assure you that it is not for lack of use of the 1925 Census that this is so. It is heavily used. Since no state census has been taken since 1925, we have no insights into citizen reaction to disclosure of more recent census data.

So much, then, for warm-ups on the census issue, which was a hot one when the NARS symposium was last held in Iowa back in 1973. To summarize, we have seen that even before the turn of the century, modern technology came to bear upon the census data. There is a correlation between the machinery available and the type of data that can be handled. We do not want to lose sight of that fact. Fifty years before the Census Bureau installed the first computer in 1950, that branch of the government touched the privacy nerve and became very cautious in the release of information about individuals. This took the form of closing the population schedules from seventy-two years to seventy-five years. The 1900 schedules were recently opened during an era of growing concern for individual privacy. There has been almost universal acceptance of the National Archives' policy and no perceptible movement that I have caught wind of to reverse that policy. Iowa's experience with its own 1925 Census

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7. "Statement of Vincent P. Barabba . . ." in Census Hearing (1975), p. 40.

would seem to suggest that the national policy is conservative--perhaps unduly so. It is not very often that Iowans can talk about liberal policies with such unqualified verbiage!

II

Now, let us launch into the second part of my talk. It is time for us to cut more deeply and specifically into the subject of the law and public records, with particular reference to the Iowa context. I must warn you at the outset that your guide is an historian and a bureaucrat (more bureaucrat than historian of recent years), not a lawyer. Herewith I must also acknowledge a key article in Volume 57 of the Iowa Law Review. This unsigned article appeared six years ago with the unlikely title "Iowa's Freedom of Information Act: Everything You've Always Wanted to Know About Public Records But Were Afraid to Ask."[8]

The historical origins of the citizen's right to inspect and copy public records and documents brings us to the English origins of American and Iowa law. I am going to skip over some things very, very quickly here. Early decisions by the English courts refused to extend a universal right to all persons to inspect all public records. But a rule of law developed in England to allow inspection when one sought to maintain or defend a legal action. Thus, one was granted a right of inspection for a specific purpose. As this concept migrated to the United States it became twisted and formed the basis for denial of inspection rights if any other purpose than maintenance or defense of a legal action were intended.

The right of a citizen to receive a certified copy of a public record has existed in the Iowa statute books since 1851 and remains substantially unchanged down to this day. However, down into the 1960's there has been considerable discussion of what constituted a public record and was therefore open to inspection. I will get to that question in a bit. Few court cases of consequence have developed. In fact, not until 1967 did a case involving the right of inspection of public records reach the Iowa Supreme Court, which I find to be a rather startling fact. It took that long. In the case of Linder v Eckard, which is the most important case that we have on this subject, the Supreme Court of Iowa ruled that real estate appraisal reports related to a plaintiff's property affected by an urban renewal project in Iowa City were not public records and need not be open to the public. The Court's line of reasoning was that no definition of public records, either in Iowa law or in the general common law, included appraisal reports. The Court found that the appraisal report was not a public record and therefore should not have been shown to the plaintiff.

While Linder v Eckard was progressing through the courts, but not directly related to that case, the Iowa General Assembly enacted

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8. Anonymous "Note" entitled "Iowa's Freedom of Information Act: Everything You've Always Wanted to Know About Public Records But Were Afraid to Ask" in Iowa Law Review (Iowa City, 1971-72) Vol. 57, pp. 1163-89.

what is now Chapter 68A of the Code, entitled "Examination of Public Records" (See Appendix A). This became effective August 9, 1967, thus it has been in force for about a decade. This is the key public records law of the State of Iowa.

While copies of Chapter 68A are being distributed, are there any questions?

QUESTION: Would you please comment on the availability of military service records.

There is a lot of material on the Iowa Militia, of course, in the Iowa Archives, but I think you are talking about the federal records and there are very specific laws governing military records. I believe almost everything is open after seventy-five years. If you are interested in more recent records, it would depend upon the series. There are some handouts the National Archives people could give you on that particular issue. I do not believe there would be any problem in Iowa.

You now have a copy of Chapter 68A as it currently stands in the Code of Iowa today. There may have been some changes since 1967, but they are not massive.

What this law did was to overthrow the traditional and narrow common law definition of public records, defined as those documents "required by law to be kept, or necessary to be kept, in the discharge of a duty imposed by law, or directed by law to serve as a memorial and evidence of something written, said, or done."[9] 68A throws that concept out completely. Prior to 1967, documents which came into the custody of public officials were not necessarily public records open to inspection. If you wished to make a functional distinction between public records and public documents, you could define the former as open to inspection and the latter as not necessarily open to inspection. Some people like to make that kind of distinction.

Chapter 68A of the Code now defines "public records" very broadly as "all records and documents of or belonging to this state or any county, city, township, school corporation, political subdivision, or tax-supported district in this state, or any branch, department, board, bureau, commission, council, or committee of any of the foregoing."[10] Under this section of the Code, every citizen of Iowa--note that: citizen of Iowa--has the right to examine and copy all public records except eleven classes of confidential records specified in the text of the Act. There are also some other items expressed elsewhere in the Code of Iowa that are not open to public inspection. That is all we have for guidance as to what is open and what is closed in the records that have been generated by the

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9. Ibid., p. 1167.

10. Chapter 68A.1, Code of Iowa 1977, Vol. 1, p. 348.

state and its various subdivisions. What this Act did was to expunge or wipe out the common law approach to public records. No longer need one show purpose as a necessary condition of access, as under the common law of England. You do not have to say why you are using the records if you walk into a courthouse or a municipal building. It is none of their darn business. You have the right of inspection, unless the item you seek is covered by one of the eleven specifications in 68A or is addressed elsewhere in the Code. There is the strong implication in 68A that the taxpayers as a class, not the individual searcher, must bear the expense of providing Iowa citizens access to the public records. As we shall see a little later, the State of Iowa has not yet made adequate provision to accomplish this with any degree of modern archival professionalism of the type one finds in our neighboring states, particularly those states to the north or to the east.

Chapter 68A of the Code of Iowa 1977 details those public records which officials shall keep confidential. Elsewhere in the Code you find such things as the following, which are also confidential: proceedings and testimony of grand juries, accident reports filed with the Department of Motor Vehicles, wills prior to probate and non-finalized dissolution of marriage records. (By the way, for the information of you out-of-staters, you cannot get a divorce in the State of Iowa anymore. You can have your marriage dissolved, but you cannot get divorced.) There is no public access to those documents until the dissolution is finalized. A few other minor classes of documents are exempted from public inspection. These two sources, then (the eleven categories in 68A and the specific exemptions elsewhere in the Code), reveal to me a strange mixture of respect for human privacy and dignity as well as lobbying pressure upon the General Assembly. Trade secrets, for example, need not be divulged, thus suggesting one source of pressure on the Iowa Legislature back in 1967. But there is a genuine concern to protect human privacy, as well.

Our anonymous legal scholar who promised "Everything You've Always Wanted to Know About Public Records But Were Afraid to Ask" concludes that, since the passage of 68A, the custodians of public records can no longer weigh and balance public interest in making decisions about access. Public interest is not the issue. He sees as a weakness of the law that even when the interests to be promoted may be clear, and clearly within the public interest, "remedies to secure these may be unavailable as a practical matter." The recordkeeper has no choice. If something is within the public interest, yet protected by one of the terms we have just discussed, the researcher has no recourse. So there is no judgement called for anymore and our legal analyst seems to think we lost something on that score when 68A passed. Further, the criminal sections of 68A do not necessarily force custodians of records to open their files because prosecuting officials may not be in sympathy with the researcher. The researcher must convince somebody that 68A is being violated and may have difficulty doing that. Our legal Dr. Rueben raises the question of whether inadequate procedures for enforcement and

"overabundance of specific limitations" might not "mock the people's right to know."[11] But despite these limitations, when 68A is weighed in the balance, it provides the public with a great heretofore unparalleled potential for determining what information is available within units of government in Iowa. It has opened a lot of doors.

So far, 68A--the Examination of Public Records--is weathering its legal tests in court very well. This is true in the case of the State of Iowa v H. Michael Neary, a recent case which I will discuss just briefly. The case was brought in the Iowa District Court of Palo Alto County, which is in the northwestern part of the state. The facts are briefly as follows: a Des Moines Register reporter, Chuck Offenburger, requested information in a court file concerning the investigation of a double homicide case. He was denied access on the grounds the material was checked out by the County Attorney (Neary) of Emmetsburg. When Offenburger was denied access by Neary, he filed suit against him on the basis of 68A. On November 2, 1977, the court ruled that Offenburger was a citizen of the state--notice that again--and that he had the right to examine, copy and publish such records. County Attorney Neary was found guilty of a misdemeanor.[12] In this case, 68A worked to open up the record.

To my knowledge, no historian or genealogist has yet been involved in a legal case on the basis of 68A. Out of sheer perversity, Mark Jones and I ran a little test. Last month, the Des Moines Police Department engaged the services of an attractive young woman to operate as a decoy in arresting men, under a recent statute, for soliciting for prostitution. Working closely with a team of policemen and using electronic gear including a tape recorder, the decoy was soon responsible for several arrests, including a college president and a minister. We placed a telephone call to the Polk County Attorney's Office and inquired about the public access to the tapes. Not that we wanted to listen to them by any means, but we were just curious about what would happen. On October 18, 1978, Ron Wheeler of the Polk County Attorney's Office informed us that public access is denied. He cited two court cases, both of which were adjudicated since the passage of 68A. He also mentioned the federal Freedom of Information Act and said that its terms were "close" to the issue. He then tailed off with the thought that if such items as the sex decoy tapes were made public, there would be dire legal consequences for the county. Interestingly enough, at no point during the conversation did Mr. Wheeler mention or appeal to 68A of the Code. We are not sure what, if any, conclusion might be drawn from this, but I did notice in the papers earlier this week that the decoy is again working and a couple more arrests were recently made. So, beware!

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11. "Iowa's Freedom of Information Act," p. 1189.

12. Des Moines Register November 5, 1977, p. 3A; Judgement Entry, Case No. 3969 in the Iowa District Court Palo Alto County, Filed November 4, 1977.

III

Let us move away from Iowa's basic public records law and try to determine how things are progressing in the state, under Iowa law, in the field of public records administration. In this context, we have at our disposal F. Gerald Ham's 1977 report entitled Iowa's State Archives Program. Since we are here, in part, under the sponsorship of the National Archives and Records Service, it is only proper to acknowledge that this report was made possible by a grant from the National Historical Publications and Records Commission. With minor exceptions, Ham found "none of the elements of a basic archival program" in operation in Iowa. I quote directly from him here: "There is no systematic program for appraisal and selection of records; no formal accessioning program, no conservation facility for rehabilitating records; no preparation of guides or finding aids; no outreach program to acquaint the public with its resources; and virtually no organization of state records." That is a very sweeping statement! Ham is not surprised that "there is virtually no scholarly research use of Iowa's state archives."[13]

The most basic recommendation of the Ham report is that the State Historical Board should "proceed without delay to organize archival functions and activities into a separate administrative unit to be known as the Division of State Archives."[14] Following this, Ham recommends creation of the title and position of State Archivist, then recruitment of an experienced archival administrator.

What has happened since the appearance of the Ham report in June of 1977? The State Historical Department appears to be on a different course than that recommended by Ham. It has not set up a Division of State Archives, but it has gotten a title and a State Archivist position set up under the specification of the Iowa Merit Employment Department. An appropriation of $20,000 for the current fiscal year was secured from the General Assembly and it was a tussle. Those who handle the state's purse strings insist that salary and all benefits and support for the position must come out of that sum. There are currently some tugs and pulls on the job description and this seems to be going on simultaneously with the screening of candidates for the position, which exists within the Division of Historical Museum and Archives.

Those of us who are interested in job descriptions might like to know that one of the "knowledges, skills, and personal characteristics" of our senior state archivist is as follows: "Ability to perform intermittent heavy lifting of objects weighing fifty or more pounds."[15]

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13. F. Gerald Ham, Iowa's State Archives Program: A Report and Recommendations, Report I, The Organization and Administration of the State's Archives and Related Historical Research Resources Programs (1977), pp. 2-3.

14. Ibid., p. 4.

15. Iowa Merit Employment Department Class Code: 01328 "Iowa State Archivist," adopted September 27, 1978.

On the way down to Des Moines today, I was musing as we were going down I-80 and watching the highway crews out working very hard to get things tidy before the bad weather comes. What would happen if we wrote a job description for the chief administrator of the Department of Transportation and specified "must be able to use a pick and shovel intermittently"? There might well be times when a state archivist will be moving boxes (believe me, I have moved my share in my position) but the focus here should be on a higher level of abstraction than ability to move boxes.

On the brighter side, once the State Archivist is hired, the National Historical Publications and Records Commission has agreed to finance the position of an Assistant State Archivist for one year and to be receptive to an application for funding for a second year. We are getting good support from the outside.

Next in importance to creating basic order in the state archives, Jerry Ham urges priority for a local records program. Since currently there is no substantial legal basis for an Iowa county and local archives program, Ham urges that appropriate legislation be enacted to "grant review authority over disposition requests made by any of the state's political subdivisions", as well as legislation to "require transfer to state archival custody . . . all records determined to be of permanent research value."[16] In other words, the state would assert control over the situation.

Nothing has been done structurally within the State Historical Department to address the issue of local records, but the Division of the State Historical Society is now into the second year of a two-year county records project funded by, again, the National Historical Publications and Records Commission. The project archivist, Mark Jones, has completed the inventories of the records of six counties, one in each congressional district of the state. Seven more inventories are currently in various stages of progress toward completion. So we know quite a bit about what is out there in the counties. What is coming to the surface from the county records project is a great deal of evidence to sustain Gerald Ham's point about the need for legislation. Recently, Mark Jones sent out a questionnaire to the county auditors, clerks, recorders and treasurers in all ninety-nine counties of the state. Fifty-four percent of the holders of such offices responded. That is a very good return for a questionnaire. Of these, seventy-eight percent requested a legally sanctioned, detailed retention-disposal schedule. So people out in the field are telling us that they need the services of an archivist. These public servants are requesting guidance of a type that only professionals in the archival and records management fields are equipped to provide.

As it currently stands, the Code of Iowa offers hazards to the preservation of some types of records important for research. Legal and administrative purposes are fairly well served as things stand, but this is not necessarily so of record series with a potential for the

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16. Ham Report, p. 6.

historian. For example, Cerro Gordo County has kept no tax lists or assessor's books older than those for the 1950's. This deprives posterity of information about a regional center for the manufacture of tile and cement--Mason City (also the hometown of the writer of The Music Man, Meredith Wilson). Des Moines County, one of the two oldest counties in the state, has retained no tax lists or assessor's books for the years prior to 1969. Other record series that can now be legally destroyed, unceremoniously, at any time, on the local level, are chattel mortgages (an obsolete record series) and jail registers. Jail registers can be a very interesting document for the social historian.

The Division of the State Historical Society knows full well that it is not the place for a permanent local records program. However, when there is some semblance of order in the state archives, we shall be in a position to pass on a valuable body of information as well as some recommendations for the conduct of such a program.

National Historical Publications and Records Commission action is now pending on another grant request from the Division of the State Historical Society; this one to do for municipal records what the county records project is doing in the area of archival work on that level. So we are getting and we hope to get a greater data base as to what is going on in the state. But we have a long way to go.

It is highly likely that the great majority of the people who handle county and municipal records as part of their daily jobs do so competently as far as legal and administrative matters are concerned. However, it is clear that many of these public servants do not comprehend the historical and genealogical potential of records under their care. By far, the majority of public servants have never encountered a research historian engaged in a major research project and we have no right to expect them to have such background. County officials have encountered genealogists in droves in recent years. Many courthouse employees consider such folk nuisances. For example, on July 26, 1978, the Council Bluffs Nonpariel carried a story about an employee of the Clerk of the District Court who was apparently driven to the breaking point by genealogists. I quote from her here: "The search for one's 'roots' is enough to drive some others up a tree," she lamented. "They come up here and say that their great-grandfather was born in Pottawattamie County in 1897 . . . And they want us to look it up." She claimed that it was much easier dealing with "odd people" she frequently encounters in helping file marriage licenses. "I can handle them," she said. "But those others about drive me crazy."

Our friend in the Pottawattamie County Clerk of Court's office, as well as her counterparts throughout the state, should be advised to be on their toes in servicing genealogists because, under 68A of the Code of Iowa, they have the same right to public records as the local lawyer preparing an abstract of title for a client. Absolutely the same right before Iowa law. Recordskeepers cannot discriminate. No

longer need one show purpose as a condition of access. Nor does the law grant priority to any user over any other user group--with one exception. The terms of the Act are applicable to "every citizen of Iowa"; nothing is said about you out-of-state barbarians.

QUESTION: Will out-of-state researchers be turned away by county officials?

I do not think so. I do not think there would be any particular discrimination against them. I do not think that out-of-staters would be treated any differently than in-staters. You might find cases to the contrary. It depends on how harassed a person might be.

As we have seen, many things must be done to bring the administration of public records in Iowa into conformity with reasonable and attainable standards of professionalism as suggested by Gerald Ham, the Archivist of our neighboring state of Wisconsin. I have only touched upon the main points here and I would like to touch upon only one more in closing.

A regional system of handling non-current public records would accomplish several worthy objectives here in Iowa: it would assist genealogists and other researchers; it would take the pressure off harassed county officials (and they are overworked in many cases, no doubt about it); it would alleviate space problems in crowded county courthouses and municipal buildings and, perhaps most important, it would help bring the administration of public records in Iowa under a single set of professional standards. The embryo for a regional records program is already written into Chapter 303 of the Code of Iowa.

It is my fervent hope that we can soon get on with the task of bringing Twentieth Century archival professionalism to bear upon the administration of public records in Iowa. Through its National Historical Publications and Records Commission grants, the National Archives and Records Service has done more than its share to help turn things around. As Chairman of the Iowa Historical Records Advisory Board, which screens applications submitted to NHPRC from Iowa, I have been in a position to see the impact of a small but dedicated group of people upon the Iowa situation. Other people outside of this group have been supportive at crucial times and have helped to lift sagging spirits. Believe me, that is very much appreciated. Only the future will tell whether our efforts have been worthwhile; the biggest challenges are yet to come.

QUESTION: You stated there are no legal reasons why the 1925 Iowa Census should not be made available, but our library could not procure a copy of the microfilm of this. Does the policy still hold or are you releasing it for sale?

This is under the administration of the Division of Historical Museum and Archives and there are copies available in state agencies

outside of Des Moines. The policy pertaining to the purchase of those reels would be under the administration of Mr. Musgrove in Des Moines and I think one could make a rather interesting case that access could be denied on the basis of the Vital Statistics Law in the Iowa Code. But I think you could also make a very good case that the records are free and open and have been available and there have been no dire consequences. Your crunch has to be with Mr. Musgrove of the Division of Historical Museum and Archives or with the State Historical Board. Are you talking about a public institution acquiring a copy of a certain portion of this?

QUESTION: No, a college library.

I suggest directing a query to the State Historical Board as the proper way to handle this.

QUESTION: Where would one be likely to find records of Iowa district schools? Are these records open?

Here is a case where there is not any good central administration over the situation. The AEA's (Area Education Agencies) inherited big batches of records. This is just one of the many cases where there should be a policy, state-wide, that would pertain to such record groups. When you come into these agencies you might get one answer in one part of the state and then an entirely different answer in a different part of the state. That is the way we are set up now. On the basis of federal law, access to student records can be denied for a considerable period of time. I am not certain of the exact length of time, but there was an Act in the mid-seventies that pertained very specifically to school records. I do not think any federal laws would pertain when the records are more than seventy-five years old. I suspect that access to Nineteenth Century school records is an administrative problem more than a legal one.

QUESTION: What is the best way to progress with a local public records program for Iowa?

You start at the top and get a public records program set up on the state level. It is a long way around, but it will eventually touch the counties, cities and villages. This is the way to go about it. Starting from the bottom up may be impossible.

QUESTION: Can a charge of discrimination be brought on the matter of writing into the State Archivist position description the necessity of being able to intermittently lift fifty pound boxes?

I was not at the hearings when this issue was discussed and I am not aware of what pressures have been brought to bear upon Mr. Musgrove or the Merit Employment Department. I think the Merit Employment Department would be the place to lodge something, if something were to be lodged.

QUESTION: If records are given to a state agency with certain restrictions, can those restrictions hold?

That is a very interesting question and one with which my institution is certainly quite concerned. As far as I know, the matter has not been contested in court. The State Historical Society has many collections that have certain types of restrictions on them, based on a written agreement with the donor. Nobody, to my knowledge, has challenged such restrictions. We have not had any difficulty with the stipulations that we have had. We came very close a few months ago to having a very serious one and it may or may not have blown over. Such matters relate to the integrity of an institution holding those records, as well as the other side (the research side), making things available. There is a case right now of a man who served in Washington, D. C., during the time when there was some influence peddling by Korean officials and his papers are at the Historical Society. His papers are pertinent to the matters before the Senate Ethics Committee and, in this case, he himself had drawn up arrangements with the Historical Society allowing access with his permission. He wants to open the entire collection after he leaves the court position he currently holds. When the investigation began unfolding, the question was what would happen if federal investigators demand access and we had to defend the terms under which the gift was given? This party eventually allowed the federal investigators to come in and stipulated exactly which boxes could be examined. That averted a head-on collision in this particular case. But, as far as I know, there have been no legal tests in Iowa of the very thing you are talking about and it is a matter that concerns me. There is more than one side to this issue.

QUESTION: There was a court case in Virginia, as I understand, about a year or two ago, in which the state reclaimed some records which had been produced by the state that had been out of its hands since before the Revolution. This upset a number of manuscripts curators and archivists. Has anything like that happened in the Midwest, in Iowa?

I do not know of anything significant in the State of Iowa along those lines. We have had people come around with parcels of public documents that they want to sell to us. This happens quite often. We have not started any proceedings against them. It could cause some real problems for little people who had gotten these materials honestly.

QUESTION: Did you buy any of the documents?

No, they were not terribly exciting.

QUESTION: Have there been experiences in other states in the area that have presented problems?

Perhaps we ought to turn that question loose to the group over coffee.

QUESTION: In the case of the Des Moines sex decoy, why didn't the County Attorney's office deny access to the tapes on the basis of 68A, particularly Section 7.4 or 7.5?

That is exactly what we anticipated and we wanted to see if that office would deny access on the basis of Section 7 of 68A. I thought they would have latched on to that right away. They did not.

QUESTION: Is it possible that county officials might deny access to materials that are open to research under Iowa's public records law?

That is very likely. I do not think the county clerks and other people who serve the public out in the counties are fully aware of the implications of 68A of the Code and we have changed them drastically in the last decade. That is one thing that we have to cope with and we have a long way to go to do that.

QUESTION: Can they charge for searching and for making copies? What can I do if I am denied access to records?

They can charge for making copies. I do not think they can charge for helping researchers unless they can demonstrate that they are covered under the terms of 68A or under other terms in the Code. Regarding denial of access, you would have to ask them to show you specifically under what terms you are being denied access. If there is no logical explanation, I think you ought to get your 68A out and show it to them. Yes, we can legally charge for copies, but the state, in assisting people with records searches, makes no provision for charging for that service. You can charge for copying, but it should be a reasonable charge.

QUESTION: What do you think the concept of 68A will spread?

I do not have my finger on the political pulse in other states to permit me to answer that very well. I think there are some very positive things about 68A. For example, you do not have to prove anything to have the right to look at a record. But I do not like that part of 68A which does not give the official any discretion whatsoever. I think that is too tight. There should be some looseness there, as under the common law.

QUESTION: Does 68A open adoption records?

No, it does not. There have been some interesting proceedings along those lines. So far, the concept of holding them secret has prevailed as a general policy.

QUESTION: I know that some county officials deny public access to materials because people have cut things out of books and walked off with them. They are denying access because they are too busy and to protect and preserve materials. What should be done?

That is a toughie and that is what that person out in Pottawattamie County was referring to in part--the horde of people descending upon them. It is the best case in the world for microfilming things and using the microfilm copy. Maybe it is the best case in the world for some kind of a regional records center, where we can handle genealogists and other researchers more effectively. But under the Code, county officials cannot deny access on the basis of being too busy. You have the same right as the local lawyer to come and look at those records.

QUESTION: Who has the right, under 68A, to examine Iowa public records?

The law specifically pertains to in-state people--"every citizen of Iowa." I think it was not terribly wise to make it pertain solely to Iowa people.

We are getting a signal that it is time for coffee and that is the best idea I have heard in a long time. [applause]

BEING SELECTIVE: WHAT TO COLLECT AND PRESERVE

by George Talbot

The past is always piling up around us. Some of it can be gathered, neatly tied and sent off to the salvage drive, but much of it remains--like a glacier, forcing its way into our concerns. There is obviously too much of the past to retain, too much to examine, too much to organize.

If we look at a past as distant as 1900, we find that the volume of material in attics and basements far outdistances any repository's capacity to hold it. In addition, we must contend with a flood of new forms of media, starting with the Industrial Revolution and photography about 1837, continuing with practical sound recording something more than a hundred years ago and practical motion pictures a little later. Today, the burgeoning sound, video recording and photographic industries make it possible for people to make records of remarkable complexity (and, perhaps, of little importance) with the greatest ease. Today, people rarely write letters and, while we have few handwritten "handmade" manuscripts of any sort, we have hundreds of thousands of handmade photographs. One subagency in the State of Wisconsin is generating 18,000 color slides each year, feels it is doing too few and demonstrated to me almost immediately that it, in fact, needs them in that impermanent and perishable form, color.

How do we select from the past for the future? The following discussion will concentrate on three topics that relate to our role as mediators between the past and the future. One, what was the past like? Or rather, what sort of record did people make as part of their lives and how did that record-making affect our view of the past? Two, what sorts of records are still available to us in attics and basements? Three, how do we select from or appraise those records when we build our institution's collections?

I. LOOKING AT THE PAST

Photography happens to provide an apt illustration of most aspects of my questions, which is to my good fortune, as I work largely with photographs. Since we are all midwesterners here and most of us are working at the local and regional level, the vast bulk of records available to us date no earlier than photography itself, a recording medium that became practical in 1839. Thus, photography's growth as a recording medium parallels the great burst of settlement and period of rapid growth in our region.

One of the most important things about photography in its early days was that it made it easy to create pictures. People took advantage of this ease in many ways. It was used to create artistic compositions, views of places of interest, portraits of the famous and powerful and a record of events and objects of every sort. It paralleled, amplified and occasionally replaced other forms of records.

At first view these records seem to reveal a comprehensive, unbiased and detailed view of life unavailable for any earlier age. A closer inspection of the first group of some fifty slides I will now show suggests that what people were interested in--what they wanted to show to others and what they thought a good picture--determined the kind of pictorial record they left. The perceptions, purposes and biases of photographers have perhaps had an even stronger effect on our vision of the past than have the perceptions, purposes and biases of the creators of written records. These images, then, suggest some of the complexity and richness of the range of handmade, unique, but at the same time, highly repetitive and ubiquitous objects of art.

The record starts as soon as photography becomes possible, with silvery miniature portraits of traders, chiefs, soldiers and settlers. Occasionally it swells to include the work of professional traveling landscape photographers who, from the 1860's through the 1910's, pleased clients with on-the-spot family portraits and views of homesteads that were demonstrations of worldly success, even when customers stood in front of barren houses with stick-like shrubs right out of Willa Cather.

Perhaps the photographer caught the local magnate posed dead center with his wife and fussily dressed child, while in the background eager twelve-year-olds stood ready to help the threshing crew with its steam tractor bedecked with brass gauges and bright paintwork. The local nurseryman may have asked his friend, the town photographer, to make a picture of his men planting a new field, with the workers posed digging in wornout secondhand clothes, while the bosses in derby hats and overcoats looked on.

Industry seized on the medium. The newly-formed International Harvester Corporation set up a department which took advertising and public relations photographs and made pictures like "Quitting Time at McCormick's", with a horde of workers leaving the plant. They also portrayed production lines, reapers, seed drills, workers and retirees, all to celebrate the company's success. These commercial pictures (among the most typical images of the time) have an easily recognizable historical value. The crews of merchant ships, lumberjacks, oil riggers, railway engineers, sales clerks and factory hands all lined up for a picture at their work place. Almost every sort of enterprise was a subject and on the shady side of town, saloons, dance hall bosses, bartenders and customers, too, provided a ready market for the photographer. Curiously, few of these pictures show people doing anything. Sometimes they are carefully posed to show off the facility, but more often everyone is carefully divorced from work or play, arranged in a formal hierarchical pose with the boss in the middle and the sweepers on the side.

By the late 1890's, the photographing of events (which was well underway at the time of the Crimean War) received a boost when it became possible to reproduce photographs cheaply in newspapers by using the half-tone process. Actual photographs, not drawings from photographs, appeared in all the metropolitan papers and photojournalism became the small-town boy's dream of glory.

Robert Taylor, the first Milwaukee Journal newspaper photographer, took an image of a streetcar accident, apparently part of an expose he was doing. We found the picture in the middle of a set of files dealing with the accident. We had other pictures, by the same photographer, of urban conditions; some of them are much more cheerful pictures of crowded streetcars. We had not realized that they were probably part of a muckraking series.

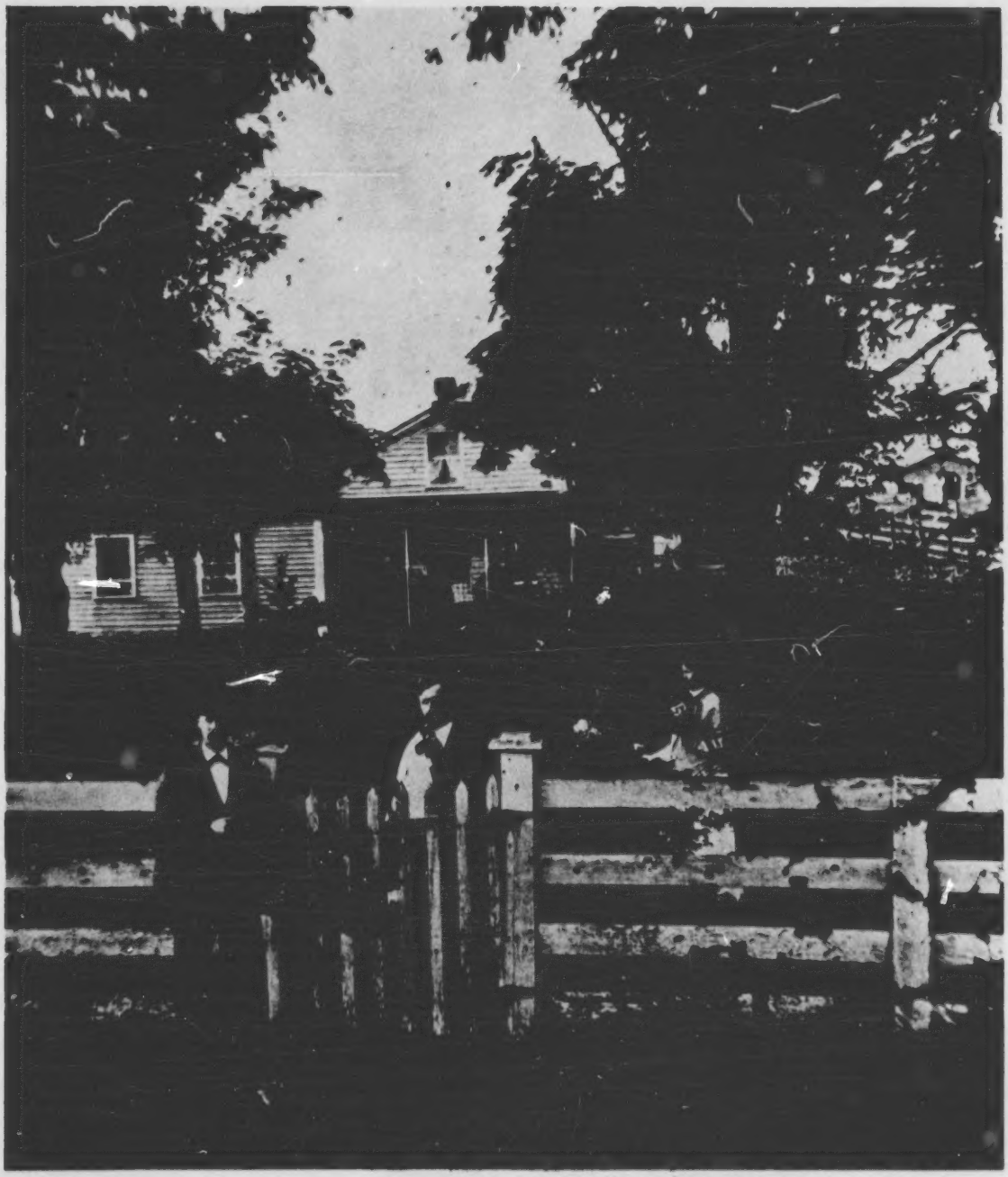
From the very beginning, photography attracted men and women who saw it as an opportunity to be artistic, adventurous or scientific and to carve out a career. In many a small town, the ambitious semiprofessional photographer or newspaper "stringer" might also take photographs of millinery shop workers, wedding banquets or anything else to gain experience, further his career, please his customers or perhaps to titilate them with disaster.

In the late 1880's, amateur photography became practical and during the thirty or forty years it took for the snapshot to find itself a formula ("Uncle Ed and Aunt Mary with the Washington Monument growing out of her head"), a great many charming and intimate views of domestic life were made. An eleven-year-old girl, a doctor's daughter, recorded her aunt and uncle, their parlor stove and their hall. One doctor showed his wife in negligee, with her hair let down almost to the floor! Another snapped his young wife, perhaps on their honeymoon, in a hotel room in Belvedere, Wisconsin and a third posed while washing his fox terrier in a child's bathtub. One "artistic amateur" even posed his wife and child in an ice cave. Our news photographer, in a domestic mood, snapped his wife sweeping the back porch in much the same way as the honeymoon bride who was caught twenty years later at a stuffy family dinner. One woman documented all her friends' living rooms. Another was fascinated with pets. Sometimes those pictures were remarkably evocative documents--a family at a supper ringing in January 1, 1900, or a son sleeping on a couch.

The amateurs almost always took pictures of good times, front rooms, celebrations, jokes and special events; while they wrote about tragedy and grief, they rarely pictured it. Most of the time they took pictures of themselves or their doctors, the wives of public officials, lawyers and college faculty--people who had the money and leisure to spend on the expensive new hobby.

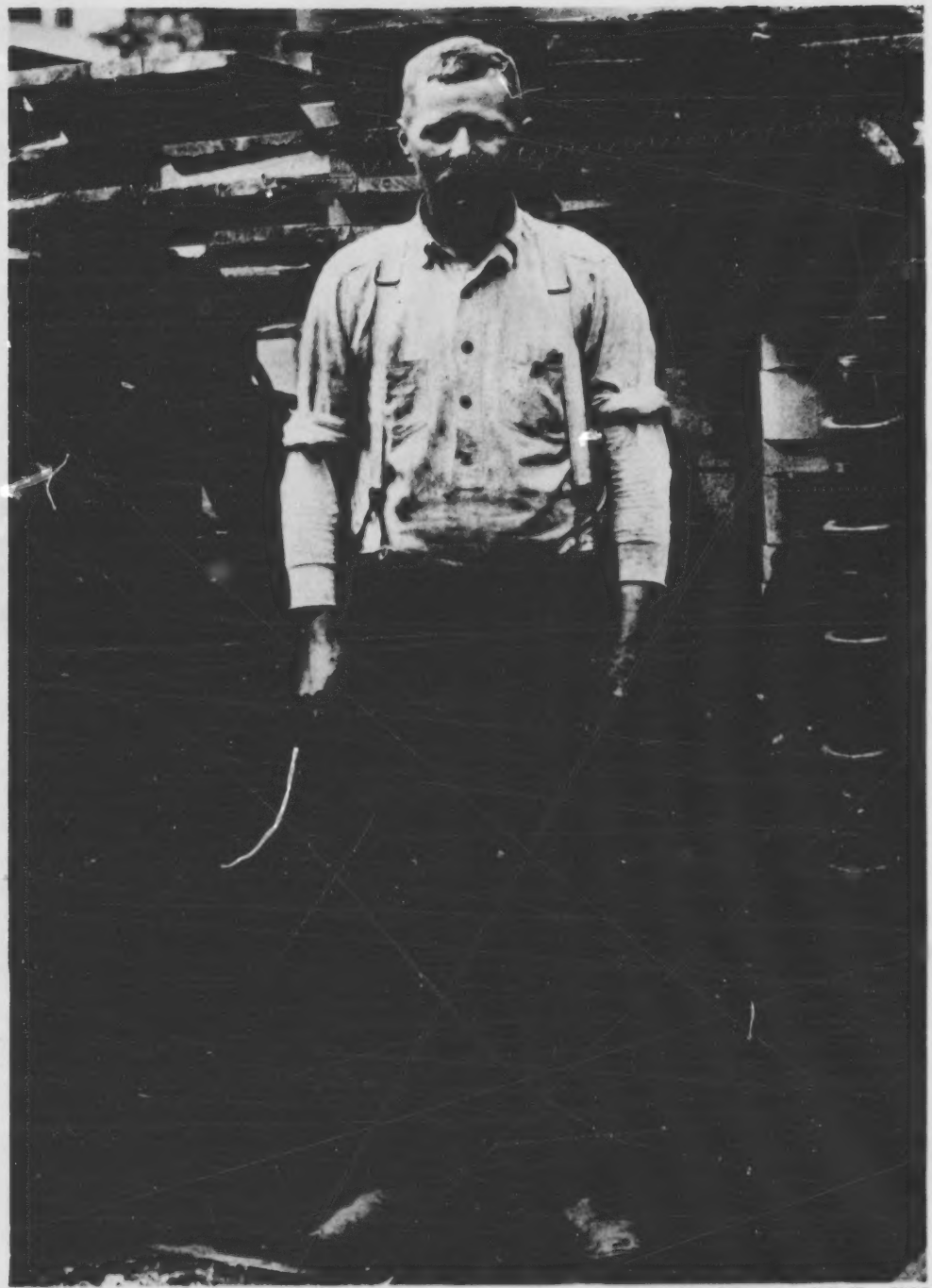
Few plain folks had any snapshots taken until just before the time of the Great War. The poor almost always were pictured by social reformers who shot entire families working at home in an attempt to make a living picking nutmeats or assembling cheap, artifical flowers on oilcloth-covered kitchen tables.

When we look at these pictures, our comfortable assumption of the completeness of the visual record falls apart. Standard family and commercial photographs repeat some subjects endlessly at the expense of others. Even journalists and "social documentary photographers" fall into stereotyped patterns, often producing valuable



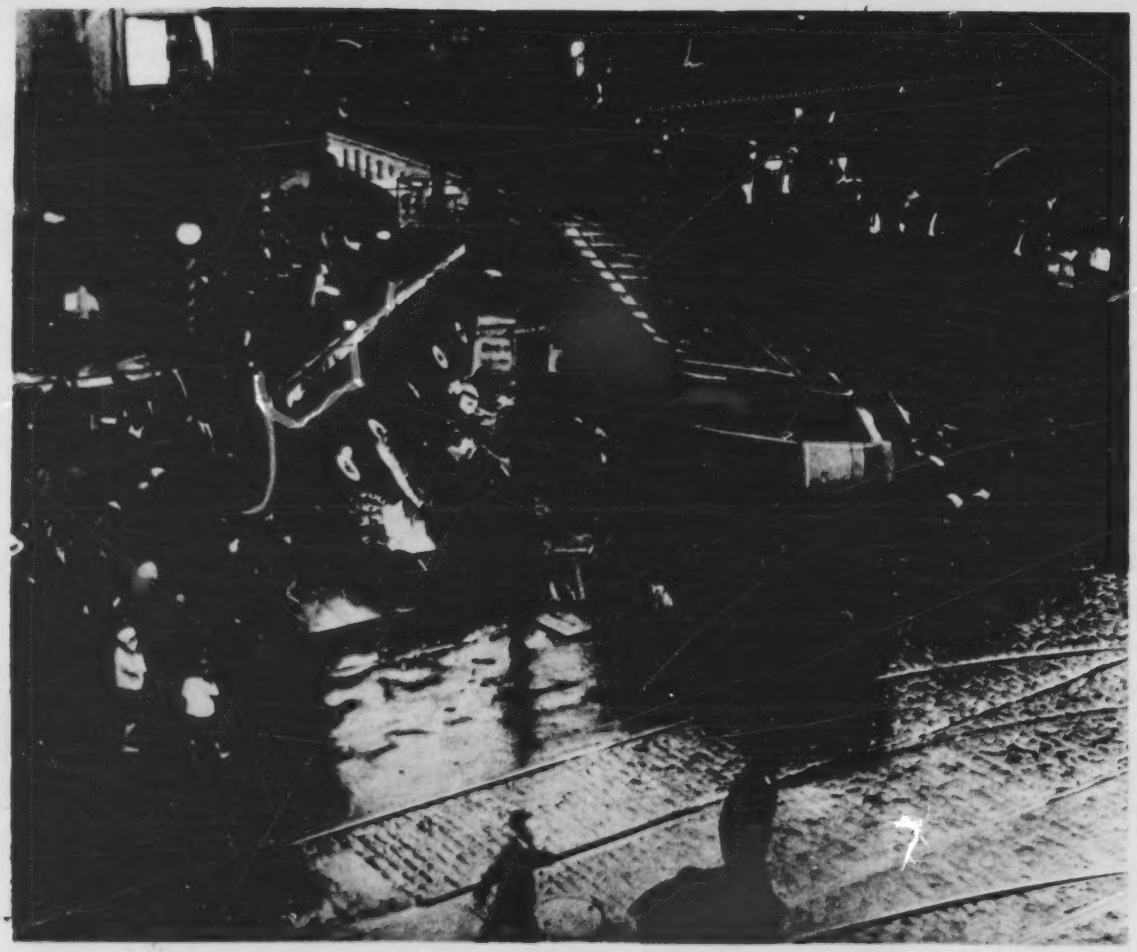
Whi. (DS) 25 (Unless otherwise noted, photographs are from the State Historical Society of Wisconsin.)

The vast preponderance of photographs taken before the 1890's were made by professionals. In 1876-77, Andrew Dahl advertised that "an experience of over six years in the view business and extensive travelling enable me to offer not only great variety but first class work." In his ten year career he photographed Norwegian settlements all over southern Wisconsin and the surrounding states. Apparently part of a "variety of first class work" was his ability to pose his clients in "natural" and "artistic" ways that emphasized their prosperity and good taste. This garden scene is part of a series taken of the Springen family of Luther Valley, Wisconsin.



International Harvester Coll.#0 — 8935

A foundry worker standing in front of core boxes; dated June 22, 1921 and from the International Harvester Corporation collection. The company used both staff photographers and outside studios to document plant, workers, health facilities, extension programs and advertising campaigns. Large numbers of negatives were "killed" from time to time, but at least 30,000 remain, along with a vast number of prints.



Whi. (X8) 29481

Street car collision, Milwaukee, June 5, 1919. Taken by J. R. Taylor for the *Milwaukee Sentinel*. This print was located in the Public Service Commission Engineering Division files. In the first decade of this century the camera record became an agent of social reform and photographs were used to expose events and conditions to the public. This and other photographs suggest that Taylor was involved in a project to call attention to transportation problems.

Whl. (868) 133

Mrs. Joseph Smith in a hotel room—one of the first and perhaps the most intimate of a long series of photographs which document the life of this childless couple and their elderly adult relatives. But the same photographer who documented the rather formal family life of the day also shot flood waters surging and breaking into spray against a bridge and a slightly comic attempt to get a fire going on a wet spring day.

WHi. (D38) 24

"January 1, 1900"—the date is inscribed on the plate. Harry Dankoler, an amateur, used flash powder to shoot this middle class family at a New Year's celebration. Photographs of parties and festivities were fairly common, and flash powder was a new "gimmick" when this was taken. However, this image is well above the usual level of such pictures—it is interesting both in a social context and in itself as a picture.

information about some people with expressive images, while scarcely recording many groups and activities. Of course, there are great quantities of information about the subjects people did have recorded and those records tell us a great deal not only about what people were interested in, but about how they wanted it to be seen.

As we examine the mass of documents, we recognize that we cannot simply talk about any one past or any one set of records that we want to collect. We must recognize that if we want to understand the past we need to collect a range and variety of materials that will strike at many areas. In a sense, the record of the past can be seen as a patchwork quilt. There were all kinds of people involved in that quilt's construction and their ethnic or regional backgrounds, social positions, occupations and associates had an effect on what they did and what they saw as important. It also had an impact on the pattern and arrangement of their records.

When they created records, they created them for their own purposes. Their purpose may have been related to the operation of government; their purpose may have been to simply let friends and family know how they "were" by means of letters, photographs or other messages--to show how they were "getting on". They may have photographed a new building under construction or kept accounts of profits and losses as a part of good business practice; but at the same time they often saw those records as evidence of hard work or success, with "another good year" penned at the close of a daybook. We are not so naive as to think that any records of these sorts are, in fact, a representation of the past that was. The records that we have from the past are things that people made in the past to show something they wanted to show. If we think that by collecting historical materials we are collecting the past as it was, we are on the wrong track. What we need to recognize is that in the past there were many different kinds of people with differing positions and experiences which led them to have widely differing views of the world they lived in and even of the past they grew out of. Somehow, when we collect, we need to recognize all of those positions, experiences, and differing views of history.

II. ATTICS AND BASEMENTS

Most records that remain uncollected in attics and basements remain in pretty common sense sorts of places. People were not usually out to deliberately destroy their part of the patchwork of history, but they may have used it for dust rags, shoved it in a corner or taken it out to the unused tobacco barn to be looked at later. Records, we have suggested, were made or kept by individuals or families and public, private and commercial groups. If we know something of how late Nineteenth Century and early Twentieth Century Americans organized their lives and themselves, we will go a long way toward deciding which attic to try first.

For the local agency, family and personal collections are a good place to start. We may find diaries, letters and other kinds of

written records, as well as visual images and all sorts of miscellaneous matter. What we may not recognize is that the rare and fragmentary mementos of ordinary people may be as valuable as the voluminous correspondence of local swells. Sometimes we find an exceptional example. At the present time, the State Historical Society of Wisconsin has a grant to do research on the Kruegers, a Pomeranian-American family that came to Wisconsin in 1850. They continued living in the same area, finally taking up settlement in 1867 on a farm which is still occupied by the family. In 1890, one of the family members took up photography, became interested in his "Pomeranianness" and started taking photographs of his grandfather engaged in oldtime pursuits like basketmaking, of all the young people in the family dressed up in Pomeranian outfits playing "immigrant", of log buildings and fences and of all the uncles, cousins, aunts and new twin daughters. The family also saved all the toys they made. They saved their clippings, biographies, scrapbooks and miscellaneous ephemera relating to their activities in the region. They even saved essays and school exercises they had done and produced both written and oral chronicles of past events. The same family has documents including birth certificates, death certificates, manuscript drafts of wills, inventories of various family possessions, marriage records and deeds. Above all, because of the pattern of succession amongst Pomeranian-Americans, it has the contracts which were written between the adult children and their parents when succeeding generations took over the farm, documents specifying terms of the sale and the support guaranteed for the elders. There are also accounts, not as full as we would like, of the dispersion of family properties. Finally, of course, there are all sorts of family photographs.

This massive hoarding does not contain all possible forms of such materials. The well-to-do may have paintings, drawings or miniatures of family members or the old home in Europe; some family records may detail expenditures in general or the confiscation of the house or its decorations.

In the Lyman Draper papers at the State Historical Society of Wisconsin, in the middle of everything else--and I mean everything--there are records of Draper's proposed new house. They include some plans complete with Queen Anne gewgaws; discussions of exactly what was to be done from room to room by the various workmen; accounts of services rendered and letters, including some haggles back and forth between members of the family and the tradesmen about the house's completion. In the Cyrus McCormick (the Reaper King) family papers, there is a wonderful interchange between Herter & Herter (one of the great New York decorating firms of the day) and Nettie Fowler McCormick, a forceful lady. Herter & Herter, in effect, wrote "If we had only known you were going to borrow our chairs to show them to another tradesman to be copied, we would never have loaned them to you." [laughter] Tucked in there is a significant quantity of material about the operation and nature of at least some part of the domestic life of the late Nineteenth Century business aristocracy.

While records like those of our six generations of Pomeranian string savers may overwhelm a small local historical society, they are exceedingly rare, immensely valuable for research purposes and should be identified and saved, perhaps by sharing with other institutions. What is more important, parts of the Krueger collection taken by themselves were fragmentary. They had to be taken together in context and they desperately needed interviews with the family to make sense out of them.

I think it is also well to look to records of local businesses and commercial activities. Accounts, daybooks, journals, orders, receipts and correspondence have priority here. As a firm grows it may be impossible to retain all of this material. However, one of the staff members at the Henry Winterthur Museum in Delaware who came out to Madison to look at furniture of "the frontier" in the 1840's (and Wisconsin was there then) discovered that we had the daybooks of one of the local furniture businesses. As it turned out, Darwin Clark was a cabinetmaker, furniture assembler, coffinmaker, paneling installer and all-purpose woodworker. In fits of delight, the researcher read through daybook after daybook, digging out all the information on where to get the best mahogany paneling and the most likely shipping sources for Sheboygan and Grand Rapids furniture. The same collection proved to be a valuable source of catalogues, some of which were produced in such small editions as to be virtually unique items. There were price lists illustrated with original photographs, one of the merchandising innovations of the post-Civil War era.

Business concerns, of course, produced all sorts of prints and photographs. Considering the rising interest in architectural and historic preservation, the records made by commercial firms when they were trying to demonstrate how wonderful and successful they were may be the best record of the way our main streets looked.

Ephemera is another important commercial by-product: programs, menus, banquet invitations, announcements, illustrated billheads, receipt forms and stationery of myriad sorts. With a little research it becomes possible to date some of those materials. In long sequences they may prove very useful for dating other records. In Wisconsin, by fortunate accident, one printer apparently pasted up scrapbooks with samples of every sort of printing job he did, including pamphlets from local schools and a long series of stationery samples in all the colors of paper then available. Because of the school pamphlets (which are dated), it is possible to date the material--at least on a decade-by-decade basis. That local print shop is just one example of a business whose records document the rest of the community. The lithographer's label file might tell us about the canning plant and a publisher could possibly document the dairy industry.

We should also look for the records of organizations and groups--churches, clubs, associations, special interest groups, labor unions and so on. I recently went up to advise an "archives com-

mittee" in northern Wisconsin about the pictures found among the records they had assembled. Among the fascinating items were the minutes of the Businessmen's Association meeting, including a long discussion of who was paying dues and who was not. Tucked in the middle of that were discussions about improving the pier and a whole series of other items that were very relevant to the growth of the community--in the middle, mind you, of a set of minutes primarily concerned with dues. The membership lists and records of such community organizations and special interest groups may provide sources of information that are unavailable in public records.

There may be public records for which you should watch. They may be the township records, school records or pamphlets and other printed reports. Rules and regulations often fall into this category. The City of Milwaukee produced a wonderful code of student behavior that was posted in classrooms. Today, those broadsides reveal the shift of attitudes toward deportment and social control in the schools.

I have a couple of other categories. First, there are the observers: the press, broadcast journalists, documentary photographers and social scientists--people in some way external to the system who attempt to be "objective". In a local context, they might be the journalists from the big city writing about your town. They might be the novelist or author discussing the local community. They might be the peripatetic photographer or they just may be the photographers working for the Farm Security Administration in the 1930's. Their photographs now reside in the Library of Congress, perhaps already microfilmed, so if they covered your area those pictures could be sitting in your institution for people to look at as part of your local record. The other category is the fine, applied, popular and folk arts as a record and perception of the community. If you are lucky enough to be in a community that has a strong sense of trying to somehow represent itself, perhaps an archival collection, rather than the art museum, should think of itself as a place that makes a record of what the Sunday painters paint, what the folk singers who create new lyrics about things going on in the town sing and so forth.

I think those points are relatively obvious. Suffice it to say, I would certainly go to every professional photographer in town. If there is a local industry which has had people write about the community and its activities, even if they are from outside of town, I would try to trace them back and locate the records they created. If I know that my town had been used as the site for a television documentary, for a news expose in the New York Times, for a western movie or whatever, I would beat a path to the producer and attempt to charm him into giving me some kind of copy of that material for my local records. I would also, for certain sorts of material, canvass the state agencies and the national agencies to see if they have materials that seem particularly appropriate and which I might be able to obtain on microfilm (or in some cases, with a great sigh

of relief, obtain outright because they happen to fall out of their collecting policy).

Finally, a local historical agency can create its own documents. Oral history is an example. If you find that certain kinds of records are unavailable, it seems obvious to me that you can create your own. We can create oral history, we can shoot films, we can make videotapes, we can conduct surveys. I put in some caveats here. It is awfully easy to do these things today but it is awfully hard to do them well. Lyman Draper had the idea of passing out diaries to people going off to the Civil War so they could write descriptions of their experiences as soldiers and bring them back. The diaries have held together fairly well in the ensuing hundred and some years.

Today, however, a great many local historical societies are going out with cassette recorders of dubious quality and making recordings, using internal microphones, in rooms in which people are clearly feeding chickens and doing track exercises in clog shoes. They then propose to build a set of local history resources for the community from these tapes. Some of the programs are ill-advised, with few well-thought-out questions and too much emphasis on working solely with the elderly on issues that may be of importance to the young and the middle-aged. Other local programs are brilliant and have gotten to the core of what people remember and perceive as important in their <u>own</u> lives. However, cassette recorders (wonderful machines that they are) have a better track record for eating tapes in the long run than they do for treating them kindly. I hesitate to think how many hundreds of hours of tapes have been generated in all the states this symposium represents, tapes which will be destroyed because they are difficult to use, because they fall apart as the leaders tear off the hubs or because the tape in a ninety-minute cassette gleefully wraps itself around the capstans when an overly eager listener tries to jump ahead to get the rest of the story.

What I have just said can be said of photographic projects, too. They can be great, but while it is easy to make tapes and photographs, it may be hard to preserve and organize them and hard to capture just the right thing. Careful planning and assessment of costs are essential.

Earlier I suggested that records were made for and from the point of view of their makers, but even this brief survey suggests another dimension: their interconnectedness. Individuals and families lived as members of larger groups and made and kept records as part of a set of social, economic and political arrangements that shaped their lives. They were also parts of commercial, voluntary and governmental institutions, which in turn kept their own records--which all the while were being preserved by insiders and outsiders with purposes of their own.

That patchwork quilt, then, is elaborately interwoven. One part of the pattern reveals new aspects of another part and then of still

another. As custodians, we, too, are part of the process and we must take special care to represent the range of the records and their interconnectedness. With luck, we can select records that will show how buyer and seller, worker and boss, or official and citizen saw the same things.

III. BUILDING ON THE PAST

Earlier I suggested that we must be selective because we do not have the space to store the mass of records being created now and those that were created in the past. I then suggested that we must be selective in a way that does justice to the variety and complexity of that mass of records.

This forced selectivity may be a blessing in disguise. It may protect us from having too much to organize, too much to wade through. A distinguished taxonomist once made the observation that if you had all the bones of all the animals that ever lived, you would not have any theory of evolution--you would have a pile of bones. Ideas about the past and understandings of ourselves do not come from the review of endless piles of bones or limitless piles of records. Ideas come from ideas and piles of bones are the testing grounds on which we try them. It seems to me we should realize that we need to be selective about the records. In some cases, this means saving "everything"; in others it means taking individual items or portions of the record in a way that will give a good idea of what the patchwork quilt our predecessors made looked like. We should save enough patches to enable people to make their own explanations of how the quilt was put together. We do not have to save all the pieces to construct some kind of theory. In fact, it is reasonable to assume that if you collect too much stuff you may never be able to sort it out. We have to have bodies of data that are small enough, or concise enough, for us to be able to handle them.

A Collecting Policy

The first step in determining whether an agency will retain all or part of a collection (the archivist's term is appraisal) is the development of a collecting policy to define the kinds of records it wants. In other words, "What do we collect? What local agencies are we responsible for?" This often comes down to things that will be of immediate, identifiable interest to people in the community. You are more interested in records or artifacts that relate to the activities of summer visitors to a resort in your area when they are at the resort than in items that relate to their business activities back in the cities. I am not saying that somebody else might not collect the entire biographical record of such families; I am saying that Washington Island and Madeline Island in Wisconsin are probably more interested in their summer peoples' summer lives on the islands than they are in their winter lives in Chicago. You may find other agencies which have other policies and will

take those Chicago records, thus protecting you from trying to collect everything in sight.

Once you have decided what the priorities may be, one of the next steps is to survey the local resources and find out who has what. If you are collecting photographs, go down to the newspaper and ask "What pictures do you have? Who was the last person who was freelancing for you? Did he keep pictures?" Then go and talk to him. If there are people in town who are interested in local history, get them together and try to find out who does have diaries, who does have manuscripts, who does have account books. A list of the resources available locally will be very useful as you decide which records to get for your collections, which may be better kept in family hands or in the hands of a local business, or which collections you had better tell some other agency about because that agency is a more appropriate repository for those records than yours.

You should also evaluate the material you already have on hand and take advantage of your own history as an institution. If you have discovered, by some wonderful accident, that you have ended up with a collection like that of the Pomeranian-American farm family I mentioned and that the people were very active in the insurance business, they may lead you to other people in the area who were also involved in the local insurance or self-assistance groups. That, in turn, may start you down the road of trying to collect the records of the insurance society that was developed by the local German-Americans. Similarly, you may discover that the son was an avid photographer who often worked with a local professional photographer in the neighboring town and you may try to find out what happened to that photographer's work. You may discover that, although you are an agricultural community, your collection has nothing to do with agriculture directly because the material that has come to you has come from doctors, lawyers and merchants, so you may begin to build a collection of farm records. You could run into some resistance on this. Many of your researchers may want to know about the town life--who built the big houses, rather than who were the dirt farmers who never amounted to anything--and if you call the farmers "old settlers", you may win more support.

After you have gone through these steps, compare your policy and goals to those of other institutions and begin to think cooperatively. Can your special interests become representative ones for a whole area? Can somebody else's interests or projects serve your organization and its public the same way? Every northern Wisconsin town has some interest in lumbering. Should each local society build a great general lumbering collection?

If you have gone through all this work, you will know what kind of a record is left. You will know where to look because you have surveyed your community. You will have a policy and know what your responsibilities are. You will have reviewed your holdings and will know your strengths and weaknesses and what other repositories are doing and what they may share with you. If you have done all

this, you know what is worth saving and what you want to save; you know the brilliant, exciting written and visual record and everything that makes your community important, interesting, exciting and dull. [laughter] "Dull" will play a big role.

Appraising the Record

You have come to the crossroads and have the stuff in hand. It may be covered with dust in the attic, but it is clearly part of someone's patchwork quilt of history. Do you want it to be part of yours? You have found it and are looking at it. The donor is hovering in the background. If possible, this is a good time to decide. Do you want all of it, part of it, none of it? If you can decide now, it will make things easier later. In the long run, it is less embarrassing to say "no" now than it will be after you have carted it down three flights of stairs. Even if an "on the spot" appraisal is not possible, any appraisal should consider these questions, not necessarily in any hierarchy; in fact, they should be asked more or less simultaneously as you go through the collection and new aspects of it emerge:

1. Is this item or collection interesting, either in itself or because it fits your collecting policy?

2. If the collection is interesting, but not covered by your policy, can you help get it to an institution that would be interested? Or, if your institution and others would be interested in all or part of the collection, how can you cooperate and share this resource?

3. If the item fits your policy, do you really want it? Do you have enough examples of that item? Can you make this item into a useful record by putting it in the right context? By identifying the subject or placing it with similar records, does your community have access to information that will allow you to build such a context?

4. Once again, does the item fit your collecting policy? If you are not sure--and this is most important--does it extend your collection because it has continuity with your holdings or does it perhaps fill gaps in the record and enrich your resources?

1. Is the item interesting?

Is the diary really a very good one? Is the item unique, unusual and particularly informative? Is it an early example of a later popular form that tells us something about when people first began to do something that way? Or is it the late survival of an earlier form, such as the little girl's scrapbook, which shows you that some people persisted in some kinds of activity long beyond the time when most people thought it was popular and, in so doing, may have acted as a reservoir of some custom, some practice or some form of behavior from which the next generation could learn. I recently

discovered a family album of the most remarkable ingenuity; it includes not only photographs, but all sorts of other written records and other family and domestic documentation. In terms of its elaborateness it certainly belongs somewhere in the 1880's, 1890's or 1910's. The album was made about five years ago by a lady who is approximately my age so her children would have a record of their family's life. She tells me that she had never seen another one like it. I do not know where her idea came from, but I am going to document it as well as I can.

Does the item have some merit in areas other than local or social history? Is it of scientific or artistic value? You may decide, if you are involved with the museum aspect of your society, that the football association trophy, because it is a work of art, is worth saving. It was made by the Gorham Silver Company at the time Gorham was the art nouveau silver maker in the United States; it is decorated with turquoise and moonstones and it is solid silver. It is a perfectly horrible monstrosity, but somebody ought to have it and ultimately you have to decide if you should. Whether an item belongs with you or not, you can act as a screening agency to make sure items of intrinsic interest are saved, if not by you, by somebody you find to help. Perhaps the trophy, which is in terrible condition and needs expensive repairs, belongs in a silver museum with a borrow-back clause so you can use it later when you need it for an exhibit. This can be a cooperative effort and you may recognize that, most of the time, the item will be far more valuable in another collection than it would be in yours.

2. Should we give it away? Should we save it?

As this issue often comes up early in the appraisal of collections, let us consider it now. Some collections fall naturally into parts and one repository may take the well-defined material of local interest, while another may accept the more ambiguous material or the items related to a different part of their creator's career. Some records that function at several levels will lose their value if separated. Identification of a philanthropy at the local level may be evidence of the character of small town life and of the sophistication of local elites in a wider historical context (who would have thought a Wisconsin creamery operator would order a football trophy set in moonstones?).

Cooperation may also play a role here: as the process of conservation often includes copying, it may be possible for an organization to give away its cake and have it, too. This is becoming increasingly common with photographic resources. Bulky, fragile or deteriorating glass or nitrate negatives are often a burden to a local society, but prints from those negatives may be a valuable resource. A local society may much prefer the latter to the former, just as it may prefer microfilms of crumbling documents to the originals.

3. Should we have it? Can we make something of it?

The first major question may be, "Is the item interesting in itself?"

We recognize, of course, that "interesting" often is a function of our personal or institutional biases. The second question, then, must surely be, "Is it the sort of thing you want?" Does it fit with the collecting priorities you have established? Is it of local or regional interest? Is it of special interest to you? For instance, the town founders' birth, high school graduation or college graduation certificates may be of great interest to the local community. Nobody else in his right mind would care. We are bombarded on a continuing basis with sheets of paper and imitation parchment (and an occasional real parchment). People bring them in and say, "Now this is very important; it is the first whatever." I look at this wretched thing and realize we already have seventy-five other examples of exactly the same kind of certificate, but on the local scene that may be just the piece of material you need and here lies a great opportunity. Can the thing you are looking at be put together with other things to make it into a research resource with wider historical significance or with the special property of connecting the present of your community with its past?

If your town is the home of the XYZ Certificate and Diploma Manufacturing Works, you may want to build the world's greatest collection of certificates and diplomas. If Hallmark happens to be in your backyard the problem is much simpler. You may find it desirable to build specialized collections of local material which, in isolation would simply be fragments of memorabilia, but in your local context become research tools. I earlier suggested that people might want to do this with things like letterheads and ephemera. If you are in a town that is big on lumbering and you have a lumbering equipment manufacturing company, you may want to think about collecting material on lumbering tools. Or you may want to stay as far away from it as you can. One or two samples of a particular item may be useless, but if you hold an extensive run you may build something of value.

Local institutions have a particular advantage in handling some types of isolated materials--they have access to a lot of people who know a great deal about their town. As a result, a local society may be able to take fragmentary collections and, by gathering information, checking records, collecting oral history and piecing all this together, create a resource of value. Thus, a series of store receipts or photographer's files could have real value if they were given "the full treatment". The amount of work is awesome and professional historical advice is probably a must. Sniggering tales about the druggist's tragic vice may be folklore of a sort and interesting as such, but they are neither local nor business history.

Sometimes an accident in recordkeeping will provide a start in building a collection. The town of Menomonie, Wisconsin, by some peculiar accident, saved a lot of the building permit plans for everything that came in, including all the tract houses. Now, you may look at me and say that there are secondary sources which will give us tract house plans for the United States ad nauseum. On the

other hand, it turns out that relatively few communities have such a series of house plans. When we went to talk to our historic preservation office about the potential advantage of trying to create a series of those kinds of building permits for an ordinary small American city, they were delighted because they had feared those kinds of records would not have been saved in a way that would make it possible to detail how Americans organized their lives. I am not suggesting that Menomonie, Wisconsin, will become the microcosmic American small-town if it saves these building plans, or that thousands of researchers will pound on their municipal door. I am saying that an extensive collection of that kind might, in the long run, prove of great value. If our area research center in that region can deal with it, it may be a sensible project. Most state agencies or cities that we have talked to about such material are horrified to hear that anyone saves it for any length of time, although most of them make pious statements about saving plans for buildings in which public safety is a concern.

Is this, then, one of those cases where a local collection, valuable in its own right, has some potential value for a much wider audience? Will it become one of the places for historians to learn about the way certain decisions were made?

Once again, there is no simple way to go about collecting. There is no single, simple list of what you should collect. Rather, you must look at who you are and what you are and take advantage of the interests of one or another group of local history buffs. Perhaps like the La Crosse Area Research Center, you will start building a definitive collection of Mississippi Riverboat pictures. Someday their building could collapse from the weight of those riverboat pictures, but somebody will have been mad and excited enough to collect them in one place and, in so doing, will provide a piece of the quilt that no one else took the time or had the inspiration to create.

4. Does it expand your collection? Does it fill gaps?

If you are looking at that collection in the attic and are still not sure, try turning the question of what fits with your collection another way. Does the item in question offer a continuation or expansion of a theme that is currently important in your holdings? Does it represent a continuity with other materials you have? Does it fill in a blank in another series? Does it add to the past or does it bring you up to the present in some particular area? You may have all the pictures of croquet you need but find a group of pictures showing farm kids in 1915 playing in a meadow where the new high school stands--twenty-five years later and two social classes lower than any previous croquet pictures in your collection. Any picture that has something to say to all those questions I just asked should receive at least qualified consideration.

Some gaps in your collection may be easy to recognize: you need early pictures of South Main Street or early records of the "Conversation Club". Often gaps may be more difficult to recognize or

keep track of: you may suspect that some local group, which has had few connections with historical agencies until recently, created records in the past, but many of those records were too rare or were considered too trivial to have survived. When they have survived, they may be in terrible condition or may appear so unremarkable that they are ignored. You may literally have to tell people that anything connected with that group is of interest, no matter what. At the State Historical Society of Wisconsin, one of our interests is in self-created documentation (I do not care whether we are talking about diaries, or letters, or photographs) by either Native or Black Americans. We know there were people in Wisconsin creating these documents during the period from the turn of the century through the post-World War I boom. We also know that Native American groups in Wisconsin are trying to put together archives of such records, but we have yet to find any Native American's negative collection showing ordinary life. We have scattered individual photographs that prove such pictures were taken by people, some of whom had done well in the World War I boom. This is not to suggest we are not interested in later documents, but these early Twentieth Century photographs have a high priority.

Look, then, for collections that will add something new or fill a gap in your holdings or extend your old interests. Another six dozen pictures of boys and girls in first communion outfits may not add anything unless they were taken earlier or later than similar ones you have. Family snapshots, even blurred ones, taken in 1885 on a Polish-American family farm showing the twenty-one-year old photographer's sister preparing for her first communion and the ensuing celebration would be gap-filling of a high order.

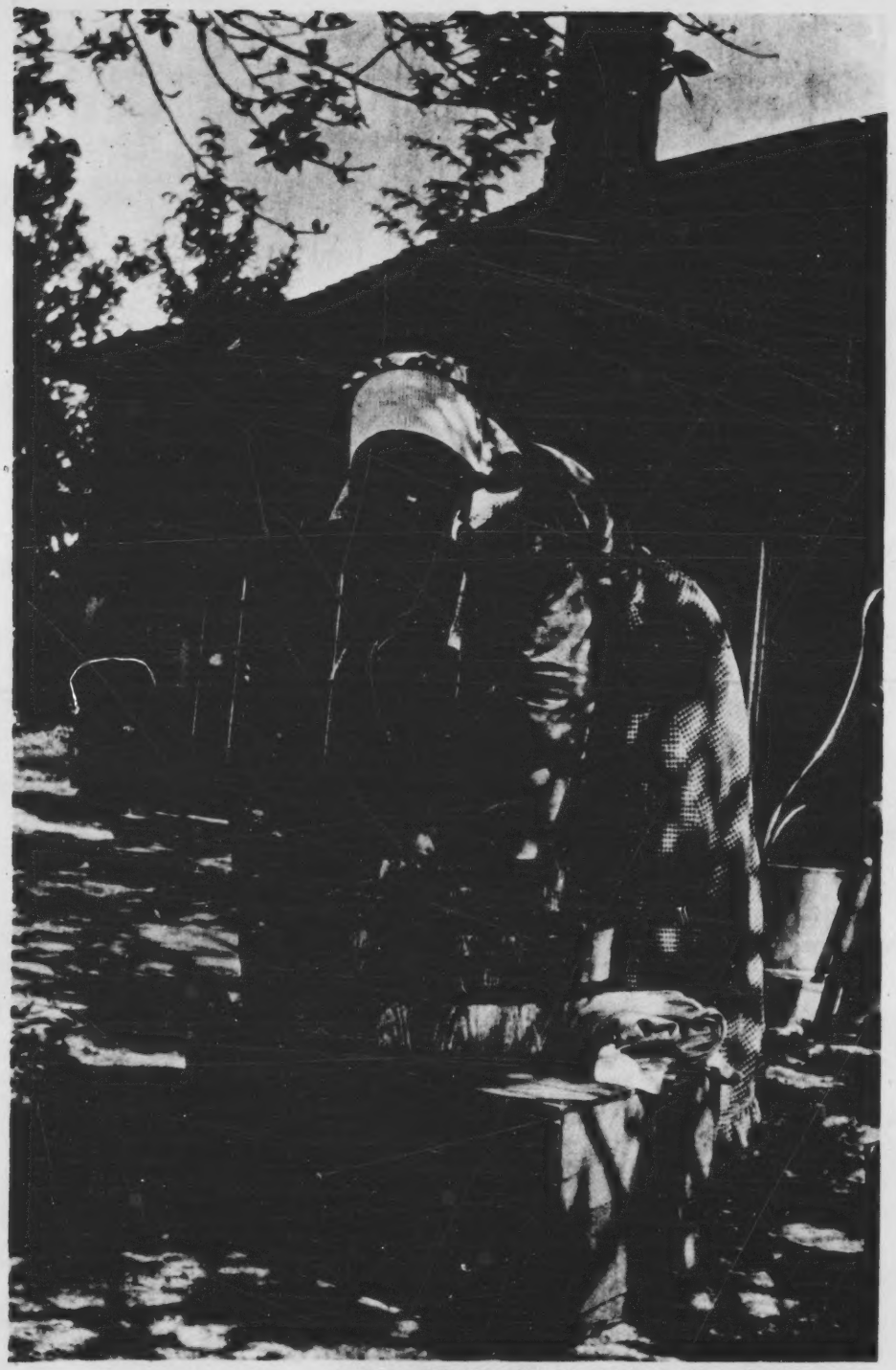
There is a collection of photographs and negatives preserved at the University of Wisconsin-River Falls Archives and Area Research Center that illustrates the notion of extending continuity and filling gaps. The photographer was a second generation Danish-American who grew up on a "dirt farm". A small group of his pictures provides a wonderful record of rural life in Wisconsin. John Peter Jacobson's pictures contrast with the bulk of our agricultural pictures from the turn of the century. Our usual shots are of university agronomists examining "a good crop of oats", of a proud young farmer holding up a prize cabbage head for a visiting government reporting team which was "puffing" settlement on the Wisconsin Cutover, of families posed in front of their homesteads--all taken by professionals. Jacobson's pictures were taken from the inside of family life: his cousins glancing up while they were scalding a freshly slaughtered hog, stacking cord wood, or carrying milk pails. They are unusual both because they were taken at least a decade earlier than most amateur farm photographs that have made their way into collections and because they are far more informal and intimate, if you will, than most amateur photographs of the period. Jacobson snapped Ma washing clothes, his folks having a family coffee (complete with a tipsy cake) in their bare matchboard kitchen and his kid brother and sister spooning up their porridge.

Jacobson's pictures display continuities as well. They are in the tradition of amateur photography in general and the tradition of the college student who became a professor in particular. Many collections in historical agencies come from just such sources. They show many places and activities of interest to a "college man" and ardent amateur photographer--university laboratories, libraries, museums (in one Jacobson picture, the approximate location of my office is filled, I think, by a birch bark canoe), rooming houses and courtships. There are all sorts of hijinks and fun: much running in and out of the picture, time exposures and the like. All are excellent but, typical of their type, they build on the record but do not move it in new directions. In fact, it was the high quality routine documentation of the River Falls campus that saved these images. When "Jake" retired he left his photographs at his university, which kept them as a part of its documentation of university life. From our point of view it was the combination of Jacobson the farm boy, Jacobson the family man and Jacobson the college professor, that was important. There may be a good many more farmer photographers who simply have never been connected with an historical agency.

For some reason, Jacobson had an interest in both standard subjects and the intimate and unexpected. He had an eye for a harvest crew asleep among haystacks or a "Grandma of 347 Euclid Avenue" reading in the fussy parlor of her college boarding house. He wanted to show the ordinary side of life. This may have been an "artistic" affectation of a college boy who read novels full of this kind of intimacy or saw paintings or drawings of domestic scenes. Whatever the inspiration, the record is wonderful. He chose captions like "Morning Porridge", "Mending", "Busy House Wife" and "Morning Coffee" and he showed off his new, sober, professorish mission oak furniture. But he was always willing to break with ordinary expectations to the point of shooting a hot air furnace down in his basement, with an electric washing machine on the side. That is the only picture of its type that I know of in Wisconsin and it fills another gap in the record.

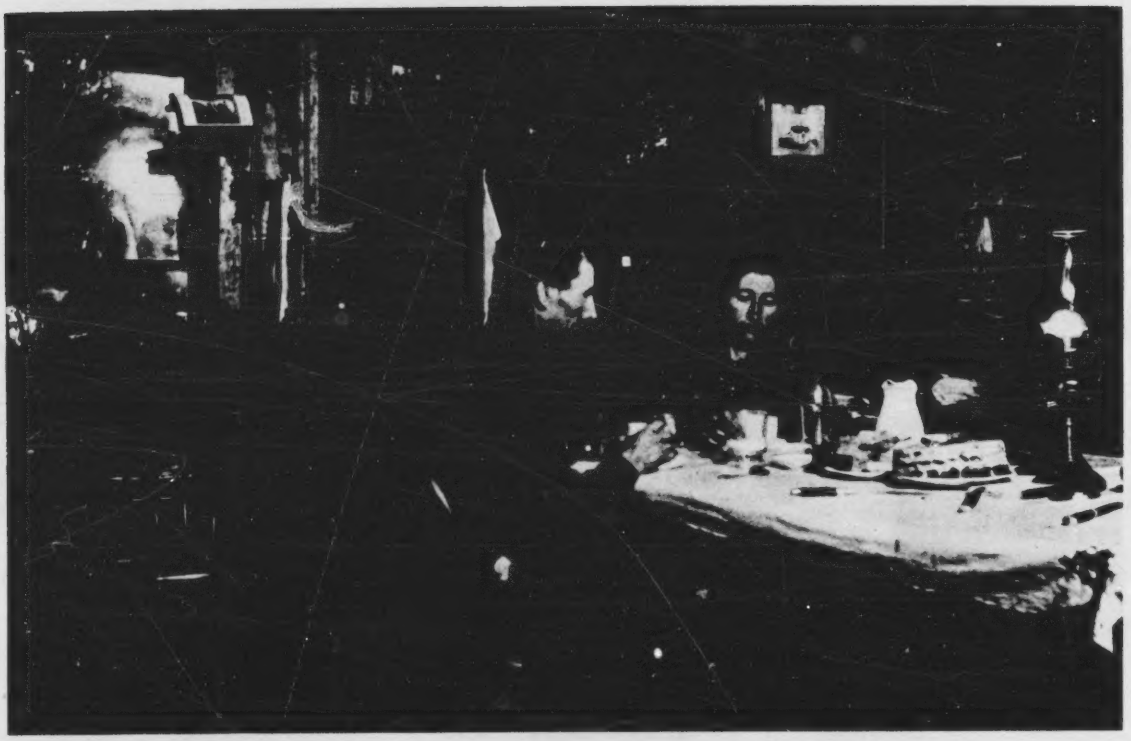
Jacobson's work, then, fills gaps in the documentation of agriculture and domestic life with pictures of obvious charm, like "Three Sisters" reading by a kerosene lamp with a glimpse of a Christmas tree in the next room. It was saved because it documented college life and, although the people at River Falls knew it was good, they did not realize its importance as a document of family and rural life. It is a perfect example of a resource to be shared. Fortunately, the collection consists of photographic negatives (some day we will have to duplicate those), so we can make prints for everyone's benefit.

What I have been saying, then, is that you have to recognize that you will want to collect a broad range of material--or collect <u>from</u> a broad range of material--but you will have to try to narrow your choices. You should construct some kind of a document, preferably a written one and preferably early on (it can always be revised



Jacobson Coll. 482, Film 13, #1 (All Jacobson pictures are from the J.P. Jacobson Collection, courtesy of the University of Wisconsin-River Falls Archives and Area Research Center.)

"Mother at Washtub" shows Mrs. Jacobson scrubbing clothes. For "Jake", who was a college student when these pictures were made, part of personal success was social mobility, but he apparently placed a high value on both his family and rural life.



Jacobson Coll. Film 18

"Morning Coffee", by James P. Jacobson, is a rare image on at least three counts. It is a picture of an ordinary farm family in their kitchen; it was taken before 1920; and it is a family picture taken by a family member for its own sake rather than by an outsider for use as a social document.

Jacobson Coll. 1606, Film 31

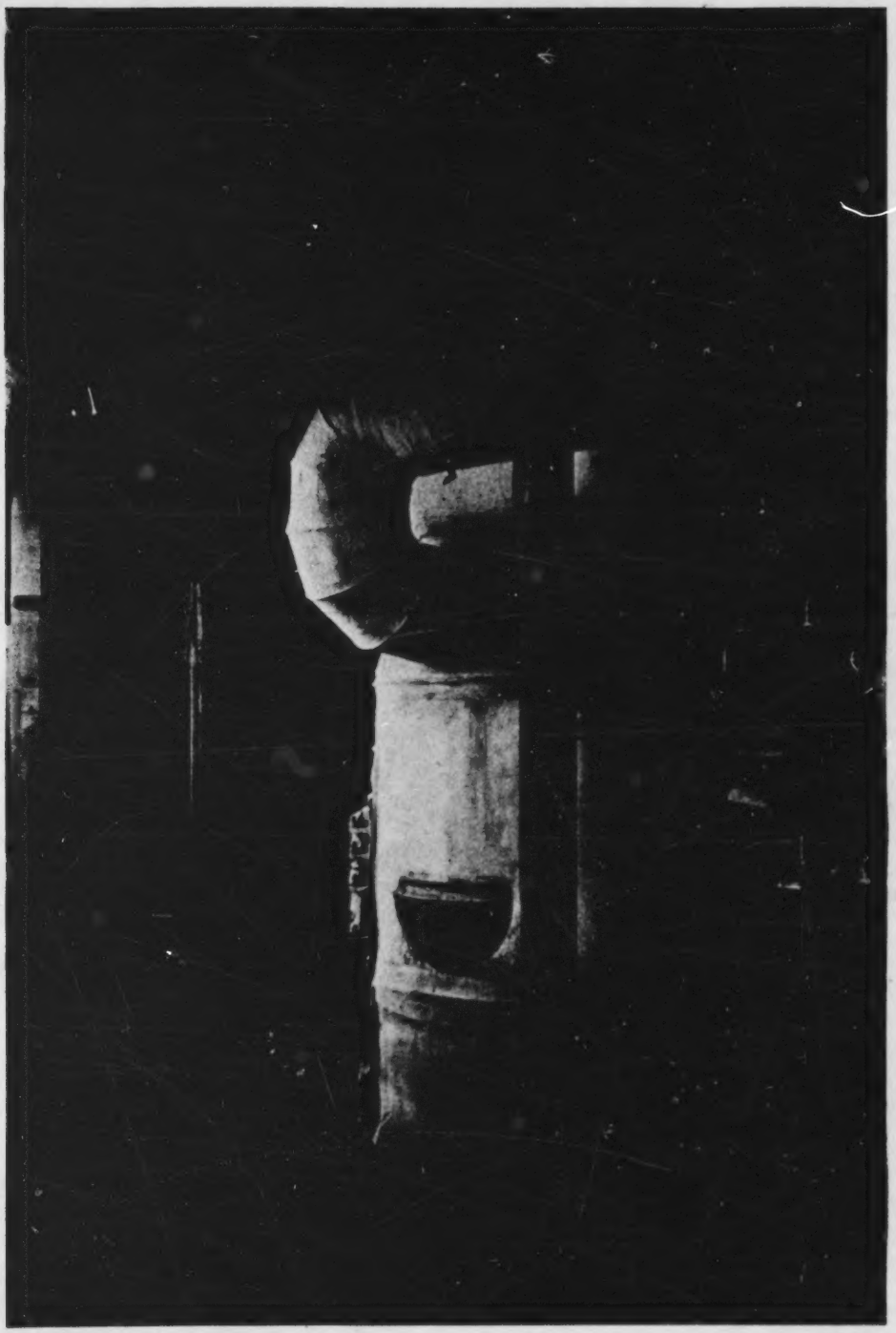
"Refreshments on the Way Home" gave added spice to a trip to Holy Hill Monastery. Guzzling and skirt lifting were standard subjects for amateur photographs of outings, not so much license as a jab at the double standard.

Jacobson Coll. 1643. Film 53

"First Breakfast" shows both Effie and "Jake" at breakfast in a new home. Jake has barely gotten into the picture in time. One of the popular gadgets of the day was a time shutter that allowed you to take a picture of yourself—if you got there soon enough.

Jacobson Coll. 1643

In "Mending", Jacobson shows off a new Mission Style dining room set in philosophically correct American Oak—popularized by Gustav Stickley who, among others, linked furniture to social reform. Effie, occupied with a simple household task, makes a record into an intimate and idealized view of domestic life.



Jacobson Coll. 841

"Furnace Room" documents both an octopus of a hot air furnace and an electric washing machine. As a physics professor Jacobson may have been interested in the practical application of science to home life, but he also had an artist's eye for light and shade and the dramatic aspect of ordinary things.

after you have looked at what you have), that will describe the parameters of the materials in which you are interested. It would be wise to survey the local resources that are available. You should then evaluate your own collection in terms of your document and those resources and decide how to add to it. Parenthetically, you should establish connections with other agencies which either coordinate with you or parallel your interests and make arrangements to exchange appropriate materials. We have been known, on rare occasions, to even send things to the university archives and people from La Crosse and River Falls will sometimes send things to us.

Finally, when you start examining material, you should recognize that it may be important because it extends your present collection, because it fills gaps in some sense or because it sheds a new and different light on what is already there. You should try to examine material in the context of the kind of background you can build for it. You should recognize that if you are going to collect you should be aiming at more than miscellaneous memorabilia; you should be trying to put together bodies of material that will help people understand whatever is unique and important in the area you are covering. If you have done all these things, you can then come and throw yourself on the conservationist and say, "I have this wonderful collection and I would now like to keep it". [applause]

QUESTION: Midway in your speech you mentioned that the Library of Congress has a collection of pictures. Is there a catalogue for it?

MR. TALBOT: No. I am referring to the Farm Security Administration collection and there is no item-by-item catalogue. On the other hand, it is organized by subject and there is some attempt at geographical retrieval. If you send somebody out there you can find out whether or not there is material that covers your area. They do not have staff to research requests that are not specific. In other words, I do not think you will get much help if you say, "Do you have anything on XYZville?"

QUESTION: The great corporations of America sometimes produced interesting pictures in the course of their development. If those pictures proved embarrassing, do you think they would still hold them in their archives?

MR. TALBOT: It depends on how they envision them as embarrassing. I do not know, for instance, how much luck you would have with the steel companies with the Homestead Strike or with Republic Steel with its strike. On the other hand, what you perceive as embarrassing and what the company perceives as embarrassing may be somewhat different things. Companies are often very generous to local historical societies and other groups in providing copies of material about their plants and operations in the area. They feel it is good public relations and are very helpful. The problem is that a great many companies have archives that are in much worse condition than those of the State of Iowa.

QUESTION: What I had in mind was, near Delphos, Iowa, Proctor and Gamble bought nine hundred acres and used them to fatten sows for soap some sixty or seventy years ago.

MR. TALBOT: I have no idea how good Proctor and Gamble's files are. Let me point out that we have some of the International Harvester collection from that time depth, but a lot of major companies, either because of accidents of nature or for housekeeping reasons, destroyed those kinds of records. However, I know Corning has a very extensive collection of records. Proctor and Gamble may no longer perceive the event you mention as a hot issue. You surely should contact them--not suggesting anything about any embarrassment.

QUESTION: A comment on that. You showed a picture of Allis-Chalmers. My father was a machinist at Allis-Chalmers and I have about fifteen or twenty photographs that they used for public relations purposes, showing him working there on different machines. They might have, in their housecleaning, disposed of these to local public relations people, newspapers or collectors. Individual employees might have that type of picture that they could come forward with and deposit---

MR. TALBOT: Very true. Yes, now that I know where those Allis-Chalmers pictures are I will talk to you tomorrow. [laughter] Another of the equipment companies, which has as much time depth as McCormick, has a less continuous pictorial record. You can retrieve pictures through workers, through newspapers--it depends on how much detective work you can go into. One thing to remember is that, in some cases, the photographer kept the negatives if the company did not have a company man shooting. It is worth doing some homework--the same way you do homework about journalists or anyone else reporting on your area--to find out if the people are around. Sometimes you can get at material that way, especially if it is old.

QUESTION: Can very old negatives be printed?

MR. TALBOT: Negatives, assuming they have not physically deteriorated, from my viewpoint are the very best things to have. If you have old negatives and they are still in good shape, you can make prints today that will be almost as good as the prints that were made at the time the negatives were taken. The reason I say "almost as good" is the quality of the negative tends to be matched to the kinds of printing materials that are available when the negative was current. Middle or late Nineteenth Century negatives are hard to print on modern paper. The first two pictures I showed, of the family garden and the path, are from negatives taken in 1875, which we still have.

QUESTION: These would date back, starting in 1910, I think.

MR. TALBOT: Are they glass or plastic film?

QUESTION: They were taken with an Eastman Kodak, in postcard size.

MR. TALBOT: Then they are film. If they have not started to turn markedly orange or yellow, which will give you some trouble, they will print beautifully. The thing you need to be careful about, though, is exposing them to any potential fire hazard; because they are nitrate film they will also make a beautiful pyrotechnic display.

QUESTION: Photographs are a very subjective thing, along with a lot of other types of materials---

MR. TALBOT: I do not think they are any more subjective than any other kind of historical record.

QUESTION: A lot of agencies have an acquisitions or a collecting department that has in mind this vision that you are portraying as a collecting policy. How do you transmit the reasons why you collected this or that to the department that is processing the collection?

MR. TALBOT: Because of the strength of character of my predecessor, who built the collection when it was in the museum and was not about to let anyone else fuss around with anything, we simultaneously act as our own field service or field evaluator and our own processing department. Any squabbles that happen, happen between me and my archivist and she and I pretty much agree most of the time. Yes, we sometimes disagree. The Society itself has a collecting branch and an archives processing department. The collecting branch often collects pictures for our section; the people in that branch are very sympathetic and talk to us all the time. If the photograph collection is big or difficult, we may go out to the field ourselves. In any case, archivists should have field experience. It may, as I suggested, be necessary to do field appraisals. I also feel that photographs should be processed by people who are sensitive to pictures. If they are not sensitive to pictures they should become sensitive, or at least sensitive enough so they do not try to process them. I am adamant about that. A lot of people can become sensitive. Our culture, our American society, has been gung-ho for visual material at least since Alexis De Tocqueville. We can spot somebody's social class, life style, even somebody's philosophical orientation, often from fifty or seventy-five feet away, just by looking. We have been <u>the</u> culture that has been in love with the photograph. I think most of you are used to using and evaluating visual material and used to using and evaluating pictures. You are, unfortunately, unlettered, but you start out with the building blocks and you learn how to spell cat and dog and eventually you can spell Appomattox. I think the same thing is true with pictures. You look at a lot of them and you look at a lot of evaluations other people have made and you try to decide what is worthwhile; you soon discover it is not an art but a question of evaluating things in context. That is not impossible to learn.

QUESTION: What, essentially, you are saying is that you, as a person with a background in photographs, have to tell the accessioning department what the importance of those photographs is.

MR. TALBOT: Yes.

QUESTION: You cannot just say, "Here's a box of photographs"; you have to spell it out.

MR. TALBOT: It seems to me that you are hopefully going to develop allies in the accessioning department. Just as Dr. Harstad was talking about the role of professionals in terms of archival centers, I think we have to talk about the role of people who are sensitive to aural material, or visual material, or various kinds of material all down the line. That does not mean that we have to have armies of professionally certified picture freaks. There are not very many of them anyway. What I am arguing is that (I did not really intend this thing to develop into a photographic acquisition discussion) you need to become picture freaks yourselves and you can. There are plenty of books and there are plenty of resources. If necessary, you have to go and say, "Look, this is not that kind of material. You have to treat this material that way." Stamp on the ground if necessary. Tantrums are useful. [laughter] We do not have much of a problem because we have a long history of separating the photographic material. One of the exercises we have student archivists do on occasion is to try to evaluate material on its intrinsic interest as pictures (visual interest) and then try to evaluate its interest in relation to an ordinary textual collection. That is kind of a standard, garden variety, learn-how-to-be-an-archivist thing to do and I think people can learn that.

QUESTION: When you get these pictures, but you do not know the people, or you do not know what company it was, how do you file them? What do you do with them in order to make them useful?

MR. TALBOT: We have seven different major forms of organization for our collections, a twenty-seven-drawer file with something like one hundred thirty-five subject matter topics in it, etcetera, etcetera. I am joking! You sit down and do some homework and try to see if you can identify some of the material and you often can. You will discover that you can tell who the photographer was and you can tell about when the picture was taken from the costume or from the mounting. You may be able to look at the picture and tell what the business or occupation is. You can set up subject matter files and they can be very obvious ones, initially. They can be residences, businesses, factories--three files--and they begin to become useful. As you learn more about the history of the town, or you begin to recognize material in the picture, you may be able to hazard some guesses about its potential usefulness or the potential subject matter that was present. You may suddenly decide, "Oh, that is the Cutter Shoe Factory!" The day will come. Other material may continue to be unidentified but still important because it is a kind of gag shot, because of the elaborateness of the wedding dress; it will have some social historical value. Believe me, almost any picture that depicts human behavior can be dated. It can probably be placed in some kind of geographical area and it may be possible, once you can do those things, to pick out much

more closely that it is a tornado and it is from the 1870's and it is a photograph and there is a river in it. You sit down with the newspapers and you can do amazing things.

Thank you very much for your attention. [applause]

PRESERVATION OF BLACK AND WHITE PHOTOGRAPHS

By Henry Wilhelm

I know most of your collections consist mainly of black and white photographs of various types. However, we should not lose sight of the fact when dealing with photographs that at the present time more than ninety percent of the photography done in the United States and Western Europe is being done in color. Black and white is essentially an antiquated process except for a few select applications, such as newspaper photography and some types of commercial photography. Most fine art photography is still being done in black and white, although this field, too, is shifting toward color. The materials that will be coming into your collections later on and the materials your successors will have to deal with are, by and large, in color. Last year the president of Kodak made a statement that the conversion to color is almost complete in terms of the amount of material they manufacture. Precise figures have not been released, but the output is certainly in excess of ninety percent color. Even though this evening we will be thinking and talking in terms of contemporary black and white materials, in terms of the bulk of photography now being done, black and white could be considered to be a nearly antiquated process.

I will try to keep this as simple as possible and provide basic guidelines on the proper handling of materials. Most of the methods I will suggest are what I believe to be the best methods, but they may not be cost-feasible for many of you. We often run into the situation where people want to know, "If I cannot do it the best way, what is a good but less expensive way?" Indeed, there is a lot of middle ground in this field, a lot of things you could do which would be better than nothing, but which cost less than the best approach. Many of the slides I will show this evening I have borrowed from Dr. Klaus B. Hendriks who is the photo conservation chemist at the Public Archives of Canada in Ottawa. He has been working with me on the preparation of a book on preservation and we have given quite a few workshops both in the United States and Canada.[1] Unfortunately, he could not be here himself, but he has been doing some significant research in the restoration of black and white photographs.

The subject of the preservation and restoration of photographs is really an infant field if you compare it to restoration of oil paintings, for example. Almost nothing has been done in the field in terms of basic research and, as you will see, it is difficult to give precise recommendations for many of the problems you will face, simply because at this point no one knows the answers. The more I have worked in photography the more I have been surprised to learn that a lot of this work has not already been done by Gov-

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1. Wilhelm, H. and Hendriks, K.B., The History and Preservation of Contemporary Photographic Materials, to be published 1981. Inquiries may be sent to Mr. Wilhelm, 723 State Street, Box 775, Grinnell, Iowa 50112.

ernment agencies or by the larger private institutions. It has only been in the past five or ten years, I think, that there has been a serious interest in the large scale preservation of photographs and this has primarily grown out of the fine arts field and out of serious historical collections, such as the collections over which George Talbot presides. The fine arts field has received a lot of publicity. It is not notably active in Iowa although there is a commercial photography gallery (The Leiserowitz Gallery) in Des Moines now. It has mostly been centered on the East and West coasts. Pictures are now being sold for a great deal of money--historical photographs have been sold for many thousands of dollars. Because of the prices involved and because of the desire to keep the photographs for years and years to come, often as an investment (there are people who buy photographs as an investment, like they do oil paintings), the assurance that the photograph will last has become of much greater concern than it once was.

There are several basic areas with which someone involved with the conservation of photographs needs to be concerned. You need a thorough knowledge of the history of photography, both in a technical sense and, ideally, in an aesthetic sense--how photography was and is actually being used. George Talbot, from what I heard of his talk, spoke on the evaluation of photographs and the need to understand the time in which they were taken and the conditions of society at that time. It is a field in which you need as wide a background as possible and if you are concerned with the actual conservation, a chemistry background is also highly desirable. Tonight we will concentrate mostly on storage conditions. I feel this is probably the most neglected area at the moment and the one in which the greatest improvement can easily be made. I want to stress the necessity to preserve the original picture. If you have a print and not the negative, that print is the original as far as you are concerned. If the negative exists somewhere else but you do not have access to it, the print you have must be considered an irreplaceable original and everything possible must be done to protect it from both chemical and physical deterioration. I would also like to stress the physical care of photographs--avoiding tears, fingerprints, scratches, marks, creases and the other damage that often occurs in public files.

The term "archival" is often applied to photographic collections. Various definitions have been given to the word. It has often been thought to mean something lasting one hundred years with very little change. In 1976, Dr. Rhoads, Archivist of the United States, was asked to give a definition of the word to one of the American National Standards Committees. Part of his definition reads: "Essentially, the term archival is synonymous with permanent and the two are frequently used interchangeably. To us they have the same meaning; that is, forever." What he is saying is that archival material, whether it is a photograph or a document, ideally will be kept forever. "Forever" should be taken to mean for longer than one hundred years. We then have to consider what the

properties of the materials are, what sorts of mechanisms are involved in their deterioration, and what we can do to halt the deterioration. "Forever" is a nebulous term, but there is ample evidence that many black and white photographs will last a very, very long time. Some of the pictures that George Talbot showed you and that I have here are a hundred or more years old and are still in quite good condition. What we need to do is understand the properties of materials and then design a storage situation or processing situation that will ensure their survival. We must start thinking in terms of the materials themselves. We cannot think in terms of human comfort. What is good for human beings is not necessarily good for photographs. This becomes particularly apparent with color photographs.

I. THE MATERIALS AND THE PROBLEMS

I will not go into historical black and white materials to any extent. Most of you will not have many of these in your collection, although you probably will have daguerreotypes if your collection goes back very far. Certainly you will have albumen prints. It is very difficult to identify some of the historical processes; that is, to tell one from the other. Many, such as ambrotypes and daguerreotypes, are very obvious to those who have worked with them. Most of the conservation principles apply about equally to all of the materials in terms of how they should be stored.

We will not get into chemical restoration or wet-processing of any type. I would advise all of you, unless you are very experienced and very knowledgeable in this area, not to attempt any restoration work on your collection. That includes the cleaning of daguerreotypes. It has recently been discovered that daguerreotypes that had been cleaned with the often recommended Thiourea solution have developed crystalline structures on their surface after cleaning. This apparently is caused by the cleaning and many people in the field now think cleaning of this type should not be done until more is known about it. For those interested in daguerreotypes, there is a very good article by Irving Pobboravsky in Technology and Conservation, Summer 1978: "Daguerreotype Preservation: The Problem of Tarnish Removal". This article describes the types of blemishes that have been observed, including some electron microscope photographs of them. I think this will have relevance tomorrow when there will be a discussion of in-house and regional conservation centers. I feel quite strongly that the problems of restoring photographs chemically are so great that it would be impossible for most institutions to even consider doing them in-house. A lot of basic research needs to be done before anything serious is attempted in the way of restoration of irreplaceable photographs. There should be regional centers, or even a single national center, that would be able to do restoration work for smaller institutions. As far as I know the only extensive investigation into chemical restoration of photographs is being conducted by the Public Archives of Canada in Ottawa. It is quite complicated as every material reacts quite differently. They have different structures and the

procedure that could be used successfully with an albumen print, for example, may not be at all suitable for a silver-gelatin print. I would therefore suggest proceeding with the utmost caution.

It is difficult to put a precise date on many black and white photographs. In the case of albumen prints, for instance, the process was not used for a great many years but is now being used again. The Chicago Albumen Works is manufacturing albumen paper and printing historical photographs, such as the Jackson Glass Plates,[2] on albumen paper. Their product is nearly indistinguishable from the original prints. There are people producing daguerreotypes today. The author of the article on tarnish removal, Irving Pobboravsky, is quite an accomplished daguerreotypist. In fact, there have been a few examples of people attempting to pass contemporary materials off as historical materials and this will probably become more prevalent as the value of photographs increases. I would not take dates of the manufacture of materials to be an absolute indication of when a particular type of photograph was made. Their introductory dates are the most crucial. The dates they were removed from the market are much more difficult to ascertain and many historic processes are in use again today by at least a few people in this country and in Europe. Albumen prints generally were not used after about 1900, but if you could see the ones being produced now you would not readily be able to tell the difference. There are some museum people who are opposed to the reintroduction of these materials. George mentioned in his talk that early negatives were generally produced with a gamma (a contrast curve shape) matched to the print materials of the time. Many collodian wet plate negatives do not print satisfactorily on contemporary materials. That is one of the reasons the Chicago Albumen Works decided to go into the manufacture of albumen paper. Only with that paper can you create a good facsimile in terms of tone scale and image color of what the print would have looked like had it been made when the paper was in common use.

MR. TALBOT, from the audience: It is not only a question of what it would look like, it is also getting all the information on it. It is almost impossible to get those very, very thin passages properly printed.

MR. WILHELM: Right. There is an article about the Chicago Albumen Works in the current issue of American Photographer, a relatively new photographic magazine. It makes interesting reading.[3]

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2. The Chicago Albumen Works offers modern albumen prints contact printed from the original William Henry Jackson glass plate negatives. The photographs were taken throughout the Western United States during the period 1879-1897 when Jackson was working out of his Denver studio. The negatives are currently in the Colorado Historical Society Collection.

3. American Photographer, November, 1978, Vol. 1, No. 6, pp. 72-79. ImageNation Co., 485 Fifth Avenue, New York, New York 10017.

Regarding modern materials, we have negatives and positives which may be on glass, paper or resin-coated paper. Resin-coated paper is a relatively recent invention which has started to largely displace conventional paper from the market. We will talk more about that later. Polyester film, which came into general use about 1965, has not been used in small roll film formats to any large extent yet, but is used extensively in sheet film formats. Many of your collections will be highly specialized and you will not have some of these materials. Glass plates are still used in astronomy and in scientific photography, but most of you would not be acquiring any at this point.

The last modern category is the silver halide diffusion transfer process, which is primarily used as the Polaroid black and white print process. It is quite a distinct process unto itself with special preservation problems. Most black and white photographs have an image composed of metallic silver, like that in your silverware basically, although it would be essentially pure silver. It looks black because the silver is dispersed in very fine particles, usually with a filament sort of structure. Because of the optical absorption properties of the silver grains, it appears to be black. Nevertheless, it is metallic silver, like silverware, and is subject to many of the same problems that you have with silverware, such as tarnishing. There are certainly other kinds of black and white photographs, such as carbon prints, but most of what you will be dealing with are silver photographs.

In their light sensitive state, photographs have emulsions with what are known as silver halides in them. These are combinations of silver and chlorine or iodine or bromine. The silver halide or silver salt is exposed to light, rendering it developable; that is, developers of various kinds will cause an image to appear. The image is composed of elemental silver and the unexposed silver remains in the form of a silver salt. Fixer is used to remove the unexposed or undeveloped silver salts from the print or negative. If the silver salts are not completely removed, stains and darkening will result, with possible eventual loss of the image. We will see later that it is very important not only to thoroughly remove all residual silver halides, but to very thoroughly remove the fixer itself. Keeping photographs and processing them correctly is actually quite simple. When we get into the specifics, we can come up with a few basic rules to follow that will ensure long term preservation of your collections.

Daguerreotypes are a separate and unique photographic form and we will not go into them in any detail. The image that you see on a daguerreotype is an alloy or amalgam of silver and mercury. This was a brilliant invention; no one is quite sure how Daguerre came up with it. It has not had any further application in photography.

Fixer is commonly referred to by at least two names, thiosulfate or hypo. "Hypo" comes from the old term hyposulfite of soda and is still used by many photographers. Technically, you would say sodium thiosulfate or, in the case of rapid fixers, ammonium thiosulfate.

Some unusual items may be in your collections. You probably have daguerreotypes, ambrotypes and tintypes. Some others you may not have. Many collections do not include carbon prints, for example. If you look at the literature of photography, you will be amazed at the number of processes that have been used, some of them very obscure. If you visit a major museum, such as the International Museum of Photography at George Eastman House in Rochester, you can see examples of most of these processes. Again, because of the wide diversity of processes that have been used, any attempt at chemical treatment is predicated on the ability to identify the process. That is not nearly as simple as many would have you believe.

The common objects that you probably have will basically fall in these categories:

1. Silver albumen prints, such as most of the famous Cartes de Visite.[4] Many millions of these were made and I am sure you have some of them.

2. Silver-gelatin prints which comprise most of the modern materials other than Polaroid prints.

3. Glass negatives, which are usually collodian plates or, more recently, gelatin plates.

4. Cellulose nitrate, which was used extensively until about 1951. The last place it was used was in the professional motion picture industry. It is unstable and combustible. There have been many fires attributed to cellulose nitrate storage, one of the most recent at George Eastman House in the summer of 1978. According to several studies, when cellulose nitrate reaches a critical point in its deterioration and is in a large mass, such as rolls of motion picture film stored in metal cans, it may spontaneously combust at as low a temperature as 106° F. The fire at Eastman House, in which at least 350 different titles of original motion picture negatives were lost, is a classic example of how not to store cellulose nitrate film. It was stored outdoors in an old abandoned incinerator; it had been very hot in Rochester the preceding week and it probably spontaneously combusted. That was the final fire department verdict on what happened, but there are some other theories. If you have cellulose nitrate film, motion picture film in particular, it is very important to keep it cold and at low relative hu-

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4. Cartes de Visite were an extremely popular form of studio photographic portrait during the middle to late 1800's. They were usually albumen prints wet-mounted on cardboard mounts with the photographer's name, studio and address printed on the front and back of the card in ornate fashion. The cards were normally 4-1/2 by 2-1/2 inches in size. Many Cartes de Visite are still in very good condition today.

midity. Certain types of refrigerators are useful for color storage and can be used for cellulose nitrate film, although you should not store nitrate with other materials. Cold will greatly slow down the process of deterioration.

Eventually, nitrate negatives should be duplicated on modern safety base material. The term "safety base" refers to film that is not combustible in the way that cellulose nitrate is. Most of you probably have still negatives on cellulose nitrate and I would strongly advise you, if you are engaged in a copying or duplicating program, not to throw away your originals. The film that is most commonly used for copying is Kodak Professional Direct Duplicating Film SO-015, which uses a unique emulsion that produces a black and white negative in a direct development step from another negative--most films would produce a positive transparency when exposed to a negative. The stability of SO-015 is not precisely known at the present time. If you throw away your original nitrate negatives and it turns out that SO-015 is in fact not an archival film, then you will have no recourse other than to copy again and you will lose quality if you have to duplicate through a second generation. We do know that SO-015 does deteriorate markedly on exposure to light; we do not know for certain what its dark-keeping characteristics are.

A fundamental rule we have to follow in this field is: if you do not know the properties of something, or if you do not know what a restoration process will do to the original, do not do it or do not use it. When you have irreplaceable original photographs, you cannot experiment with them. For example, if a new envelope appears on the market and you do not have good scientific evidence that the envelope will not contribute to the deterioration of the material you plan to place in it, you should not use that product. We will talk more about envelopes later. Cleaning daguerreotypes is another example. That was a process thought to be quite safe for a number of years, but is now questioned. SO-015 may be another example; we do not yet know.

The conventional silver-gelatin print rests on a paper support. The paper originally was rag paper. When Kodak began manufacturing, the rag paper was imported from Europe. The paper base was later changed to a mixture of rag paper and purified wood cellulose and currently all conventional paper prints are made of wood cellulose papers. According to a number of accelerated aging tests, these are thought to be quite stable, although there are those who disagree. Most of the manufacturing information and some data concerning properties of materials, particularly the silver halide emulsions themselves, are secrets. Many of the procedures and components are not covered by patents. Long ago, Kodak established the tradition that a successful secret was much better than a patent because patents run out and people can read and infringe upon them. That policy continues today, so there is a great deal we do not know about the properties of these materials.

Above the paper base (which is quite thick relative to the emulsion) there is a layer known as the baryta layer, which consists of barium sulfate dispersed in gelatin. That is what gives the paper its very smooth white top surface. The silver-gelatin emulsion is coated on top of that and a gelatin overcoat is placed on the top of the whole assembly to protect it from abrasion. That is a very simplified view of photographic paper manufacture. Most black and white materials, whether they are negatives or prints, are basically constructed in this way. Gelatin has been used as a binder for photographic emulsions because it has several very unique properties. There have been a number of synthetic emulsions used in limited ways, but nothing has ever been found that works quite as well as gelatin in so many different areas at such a low cost.

Resin-coated paper (commonly known as RC paper) first came into widespread use about 1968 in Kodak color materials and is now largely displacing conventional papers for black and white use. It has a conventional paper base, but in order to keep the paper waterproof so it will not absorb developing or processing solutions or water during processing, it is coated on both sides with polyethylene. The bottom layer is clear polyethylene coating. The top layer is polyethylene pigmented with titanium dioxide. Otherwise, the silver halide emulsion and overcoat are quite the same as on conventional fiber base paper prints. Resin-coating is a method of making the photograph waterproof (with respect to processing solutions) that is less expensive than making, for example, a pigmented film base print. Film base prints such as modern Cibachrome have been used, but they are a lot more expensive than coating the paper with polyethylene. This, after considerable experimentation, was found to be the most satisfactory and is still the lowest cost method of making photographic paper waterproof. That was the objective of RC paper. It will dry, using a hot air dryer, in thirty seconds. The conventional print cannot dry as rapidly because water is absorbed by the paper.

Early Kodak resin-coated paper proved to be quite unstable during long exposure to light. One of my 1970 Kodak color prints has cracks all over the surface. That is the result of natural aging in a home environment at relatively low level illumination. This type of deterioration, the cracking of the polyethylene layer which also cracks the emulsion, is a type of deterioration which did not exist with any previous photographic product. This is another problem that we always run into in the field: you may not know how a material is going to behave until quite a few years after it is introduced and then it is too late. This sort of cracking can be simulated with various accelerated aging tests, but in this particular example, the damage occurred under natural conditions in about eight years of storage in the home. If you have any resin-coated prints in your collection at present, never display them. You may use that as a fairly hard and fast rule.

I think all museums should make great use of copies for display or handling purposes. You can make very good black and white

copies. In general, if permanent display is desired, the best approach is to copy the original and then store it in the best way you can. One area in which virtually nothing has been published is the effect of light on black and white photographs other than those on RC paper--in other words, on conventional paper prints. At the present time we simply do not know what long term exposure to light will do to the print. We do know, of course, that light deteriorates paper, cellulose and probably gelatin. In theory, light would not affect the silver image directly, but if the paper is deteriorating underneath, the image will, of course, eventually be affected.

Several years ago an improved type of RC pigment and a plastic stabilizer system were introduced by Kodak; accelerated tests have led Kodak to believe these substantially increase the resistance to light-caused cracking of the paper. This more recent type was projected to crack in about thirty-five years of typical display use--not particularly harsh conditons. Many museums would have worse situations. That is the Kodak projection derived from accelerated aging tests. Needless to say, thirty-five years have not passed since the introduction of that paper, so we do not know for sure if that will correlate. In 1978, a third major type of resin-coated paper was introduced; it can now be purchased in the Number II series of Kodak papers. Polycontrast Rapid II RC is projected to have a cracking life, according to Kodak, of more than 125 years of typical display.

The paper will also crack if you have humidity fluctuations in storage. That is, if your storage environment has humidity that goes from very low to very high, cycling back and forth. This creates a physical stress on the emulsion of the paper. The polyethylene support does not readily absorb moisture and does not dimensionally change very much when it does. The emulsion expands and contracts repeatedly, which results in another kind of cracking. It is not presently known whether the new papers are any improvement over the old with respect to that type of cracking.

There is another type of deterioration evident in RC papers. Kodak printed a statement concerning it in their recent publication G-1.[5] The titanium dioxide used as the pigment in the top resin-coated layer is itself light reactive and, in the process of deterioration of the polyethylene, will release oxidants that can bleach the silver image. This, again, is a new type of deterioration that did not exist in the previous conventional papers. Barium sulfate used in the top coating does not react in that fashion. The statement is made in Kodak publication G-1 that if you want to display a black and white resin-coated print behind glass for a long period of time, it should be treated with gold toner to protect the image from itself. The current information is still far from complete. In fact, the test methods Kodak has used in making these projections have not been completely defined; we do

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5. Kodak Publication G-1, Kodak B/W Photographic Papers, Eastman Kodak Company, Rochester, New York 14650.

not know exactly what was done. I would strongly advise museums not to use resin-coated papers, but to continue to use conventional paper and continue to advise others to do that if they are producing photographs they want to last as long as possible. There is little doubt that if prolonged display is planned, conventional paper will outlast polyethylene resin-coated paper.

The principal causes of deterioration of photographs have been known for a great many years. In 1855, the Royal Photographic Society in England established a committee to investigate the causes of photographic print fading. It was noted that many albumen prints were fading and that photographs, possibly because they were a relatively new invention, were generally thought to be very, very precious. There was considerable concern when it was noted that they were not permanent in many cases. The committee, which later became known as the "Fading Committee", issued a report which listed the major causes of the fading of prints. The first cause was imperfect washing of prints after fixation. The second was the use of old or insufficient acid fixing baths which contain too much sulfur. The third was acidity of the gum used for mounting prints and the fourth was the moisture and sulfur in the atmosphere of large towns (that is, air pollution, which was quite serious in London back in those days). The committee offered several recommendations to prevent fading, including adequate washing, protection from excess moisture and protection from sulfur in the air. One method suggested to protect a display print from sulfur was simply to frame it under glass. The committee also recommended protective toning of prints with gold chloride.

The Fading Committee's findings and its recommendations, issued in 1855, are still quite valid today. There are a few more recently identified causes we might add to the list. One is drying paper prints on contaminated dryers; that is, dryers with cloth belts which contain large amounts of thiosulfate. There are two major types of silver image fading. One is oxidation fading and the second is sulfur fading. I will not go into detail here, except to say that you do want to prevent both from occurring and there are several ways you can accomplish that.

II. STORAGE ENVIRONMENT

The most important thing you can do is establish proper temperature and relative humidity controls for storing photographs. You should obtain copies of the relevant American National Standards Institute's standards for storage of photographs. Some of you probably have them already. For those who do not, you may write to the Standards Institute (commonly known as ANSI) at 1430 Broadway, New York, New York 10018. There are a number of standards, one dealing with storage of processed photographic film (pH 1.43) and others for plates and papers. You will see that the temperature should be less than 70° F. for short term storage; certainly not above 75° and it should never exceed 90°. Relative humidity

should be less than 60 percent. If it gets above 60 percent, the rate of chemical deterioration increases and fungus growth starts. You probably have examples of fungus damage in your collection.

There are also ANSI recommendations for archival storage of film. You will learn that there are different relative humidity recommendations for different products. Modern polyester film is thought to be a little bit more sensitive to low humidity cycling because the bond between the emulsion and the film base is not quite as good as on cellulose triacetate films. Most of the film you buy, for instance Tri-X in 35mm rolls, is on a base of cellulose triacetate, which is often called cellulose ester. If there were any one recommendation of relative humidity for all materials, it would be 30 percent. That is something for which you should strive. I would say that the most important single thing you can do to preserve a collection is to maintain the humidity at 30 or 40 percent. Most air conditioning systems do not have positive relative humidity control and you will probably have to hire an engineering company familiar with the problem to add the necessary equipment. Most air conditioning plants do not operate at all in the spring and the fall when it is relatively cool outside. Thus, most have total humidity control failure during those periods. It is quite possible in an air conditioned building to have humidity levels reach as high as 80 or 90 percent at certain points of the year. This can easily happen with a thunderstorm going on outside when the air temperature is around 70° or 65°. You should buy an accurate relative humidity gauge or hygrometer.[6] A lot of people like to have recording hygrometers that keep a paper chart, but they are quite expensive and not strictly necessary.

You can install home dehumidifiers. Quite a few companies sell them: Westinghouse, Sears Roebuck and others. Some of the better ones now have a crude humidistat control. Using a good hygrometer, you could observe at what point it turns on and off. You can add dehumidifiers to your storage area; that is an inexpensive approach that can work quite well. In most buildings during the winter, the relative humidity is very low indeed and may go way below 30 percent. You might want to humidify the air somewhat at that point. I would say that of the two extremes, high relative humidity is far worse than low relative humidity.

Temperature should be as low as possible. There seems to be little doubt about that. The problems involve both cost (summertime air conditioning costs) and, if you have open files in which people have to work, human comfort. There is usually some objection to having the temperature below zero, but with color film you will see that we are going to have to do this anyway. In the winter it is quite easy to maintain low temperatures and I would say that in cycling back and forth between the summer and the winter you can easily maintain 55° or 60° in the winter simply by turning

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6. See Appendix B.

the heat down in the storage areas. Most air conditioning plants are incapable of going below 60° or 65° because they will ice up at that point, but special equipment can be provided to maintain any temperature you would like. Most, or all, of the chemical reactions involved in deteriorating photographs increase with increased temperature and increased relative humidity. You probably will not be able to chemically treat the photographs already in your collection. If they are mounted, you will not generally be able to change the mounts. By controlling the humidity and temperature, you will reduce as much as possible the chemical activity in the photographs.

The environmental standard for paper prints is generally the same as for film. The recommended minimum temperature of 59° F. is based on human comfort, not the benefit of the material. Many institutions, I think, should seriously consider cold storage for certain parts of their black and white collection; for example, a valuable album of prints with captioned material in it. In most cases, albums are made on very poor quality paper, with the prints pasted in, probably with poor quality adhesives. You may see significant deterioration already, but that could be arrested by storing the album at below 0° F. at 30 percent relative humidity. The same principle holds true with nitrate film. If you are waiting for both more expertise in the field of restoration and, in many cases, more financing, you can save deteriorating materials by putting them in cold storage. That will, of course, reduce access, but in the case of an album you could photograph each page, caption and all, and make prints of it. That would preserve it in an adequate form for research purposes. Items can be removed from cold storage for recopying or for viewing the original object.

Tests have been made to determine the decomposition rate of sodium-thiosulphate and polythionates at different level humidities. I think the results illustrate the benefit of low relative humidity storage. At 14 percent relative humidity, after 279 days, the thiosulfate (or fixer) concentration has not changed at all. That is, it has remained in stable chemical form during that period. At a high relative humidity of 88 percent, after that same time period, the concentration of fixer has dropped all the way to 2 percent. It has not evaporated, but simply changed into other chemical forms. That gives a general indication of how the chemical activity of these materials is reduced at low relative humidity.

If you do not have air conditioning, which is true for some of the smaller historical societies, you would be aghast at the relative humidity and temperature conditions that could be reached during the summer. In fact, some of the conditions that you see in practice are what in the research field are known as accelerated aging conditions, where temperatures occasionally exceed 100° F. and humidity is up to 80 percent! Protecting the photographs from oxidizing gases and from gases containing sulfur is perhaps a little more difficult, although if you have a sufficient budget, air filtration equipment is certainly available to purify the air.

Agfa has produced a colloidal silver test strip, which is a glass plate coated with a colloidal silver compound approximately eight to ten times as sensitive to things that would deteriorate photographs as the actual photographs are. You can hang these plates around your storage area. They are covered with the Agfa name and symbol; the Agfa symbol is composed of a lacquer that protects the colloidal silver layer from direct exposure to the gases in the air. If you can read the word Agfa, the colloidal silver has reacted to something in the air, which means that the amount of time it took the plate to react, multiplied by ten, is the amount of time it will take for the photographs to be chemically affected by the atmosphere in the storage area. These plates respond quite rapidly to the ozone produced by electrostatic copying machines, so another basic recommendation is not to have any electrostatic copiers or other electrostatic devices in your photographic storage area. Ozone is a very powerful oxidant that will oxidize silver images. Colloidal test plates are not commercially available from Agfa anymore. They made about 5,000 of them and passed them around to various archives in Europe and elsewhere. A major microfilm archive installed a new tile floor and noticed that after about two days the test plate had reacted. The reaction was determined to have been caused by the adhesive used to glue the tile to the concrete. I think that is a clear example of how detrimental some apparently innocent things can be. This, fortunately, was a well endowed institution which then proceeded to tear up the entire floor and start again with other materials. Keep in mind that the test plates have responded quite rapidly to electrostatic machines. The familiar copier made by Xerox is an example, but there are many others--the IBM machine is one and the Kodak Ektaprint machine is another. Keep these machines out of your storage area.

III. ENVELOPES

The subject of what to store photographs in remains very controversial. There is a new ANSI standard, released in 1978, dealing with the requirements for filing enclosures. ANSI standards are produced by committees consisting of people from the museum and archive fields, people from industry and anyone else who is seriously interested in the subject. They do not give brand name recommendations or say that a particular product does meet this requirement and others do not. That is a drawback for many people because you will see only the complicated tests involved. The tests are so complicated that most people cannot administer them. Here are some basic recommendations. The first is that you should not use glassine for storage of photographs. You probably have many negatives in glassine envelopes already. A basic requirement for an enclosure material is that it be as stable as the photograph in it. It will not do you any good to store a photograph which is capable of lasting 300 years in an enclosure that decomposes in 50 years. This is partly because the enclosure will have to be replaced, but, perhaps more seriously, because the decomposition products of the enclosure material will usually affect the photograph itself. The two readily available materials

which are approved in the standards are uncoated polyester (which DuPont markets as Mylar) and cellulose triacetate (Kodak's brand, Kodacel, is one popular variety). Those two materials are also used for film base. Extensive testing has determined they are safe to use for photographic support. Therefore, it is logical to assume that if they are good enough to support the emulsion, they are good enough for storage of the print. At present, these are the only two materials that can be recommended.

There is no paper product on the market that I can recommend with any certainty as absolutely safe for use with photographs. This includes Hollinger envelopes, which many of you probably use. I am not saying that Hollinger envelopes are not safe. I am saying that at this point we do not know whether or not they are safe. There is no published work on the effect of Hollinger envelopes on the various types of photographs. The paper was originally used for document storage. It is an alkaline buffered high pH paper. I am not entirely sure how it came to be used for negative envelopes. Museums probably asked for it. A number of different types of paper have been used by the Hollinger Corporation to make its envelopes. The term "Permalife" is a trademark that was owned by the Standard Paper Company of Richmond, which has since gone out of business and been acquired by the Howard Paper Company of Ohio. Hollinger does not use Permalife paper anymore. You will not see the Permalife name on any current Hollinger products. Permalife paper envelopes are available from another company now (Photofile in Illinois), but again, there is no complete study of their effect on photographs.

Seven tests are performed to determine if paper is adequate for photographic storage and many of these tests are exceedingly complicated. The photographic activity test is probably the most important. It investigates the effect the material has on the silver image, causing it to fade or stain or whatever. Klaus Hendriks had the Public Archives of Canada hire an independent testing laboratory in Canada to run all of these tests on a selection of paper envelopes, including the Hollinger envelopes and quite a few other types. None of the paper envelopes tested met all the requirements. Older paper envelopes with glued seams in which unsafe glues have been used often produce a reflected light effect on the print. A surface silver deposit (a silvery sheen which is actually a silver compound) which, through various chemical phases migrates up from the image silver, can be seen on many negatives and prints. In many cases it is caused by the envelope itself, by the glued seam. It is possible to remove it chemically, but I would not advise doing so unless you are quite familiar with the procedures involved.

You can enclose photographs in polyester, using double sided adhesive tape. The Library of Congress has recommended this procedure and, as far as is known, it is safe. The only questionable part of it would be the tape, but the Library of Congress has done some work with that and believes the tape to be safe. Some people

may disagree. I strongly believe that transparent envelopes are much better than paper ones, even as a basic concept, because with a transparent enclosure there is no need to remove the print or negative from the enclosure to see what it looks like or to read caption information on the back. It keeps finger prints off the image and is a substantial barrier to migration of chemicals from improperly processed or mounted prints to other prints. It probably offers significant protection against air pollutants in a closed file situation. Most important is the fact that you do not have to remove the photograph from the enclosure to see what it looks like.

At present, the only source of polyester sleeves of the proper sizes is TALAS.[7] The TALAS polyester sleeve opens so the negative or print does not have to slide in and out of it. This avoids surface scratching. The plastic itself may not scratch, but any small particles of dirt, which are certain to become imbedded on the print or picked up on the plastic, could scratch the surface. If you expect to remove and insert a print into a filing enclosure perhaps a thousand times over many years, it is a major advantage to have this type of sleeve. It simply closes, a flap goes around it to hold it and you can see perfectly well through the front and the back if you want to see the caption information.

Kodak sells a product known as Kodak Transparent Sleeves, which is made of cellulose triacetate. Aside from the fact that you have to slide the transparencies in and out, these sleeves are probably quite satisfactory. However, they are not large enough for most paper prints or glass plates. Most paper prints are somewhat larger than the nominal 8x10 size, for example, so they will not fit in Kodak sleeves.

The sleeves sold by TALAS are large enough to accommodate prints and this is the only product that I could unequivocally recommend at this time. Even this product can create a problem known as ferrotyping if you cannot control your relative humidity. Under conditions of very high relative humidity, the smooth plastic surface of the sleeve can cause changes in surface gloss of the photograph that will show up in printing or when you look at it. In recommending this product I am assuming that you will have taken care of humidity problems. That is the first and most important thing to do.

If you have negative files that are already in old paper envelopes with a lot of caption or dating material on them, you may want to copy the envelopes on high quality paper, such as a 100 percent rag content, neutral pH paper (which electrostatic copiers will accommodate) and place that information behind the print in the transparent sleeve. You cannot write on the transparent sleeve itself with anything that we now know for certain to be safe.

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7. TALAS, 130 Fifth Avenue, New York, New York 10011.

IV. PROCESSING

Processing for permanence is a subject which has interested me a great deal, but I will not spend much time on it here. There have been a number of publications on how to do it and there is an ANSI standard which gives the procedure for producing prints or films from which all the fixer has been removed so they can be used as control samples for accelerated aging tests. This procedure will remove all of the sodium thiosulfate from the fixer. Kodak pamphlet number J-19, B/W Processing for Permanence, describes the basic procedures for this process. The book that Klaus Hendriks and I will be publishing in 1981 goes into this in great detail, in a more practical way.

You should air dry prints, otherwise you run the risk of contamination. I would suggest, if at all possible, even if you are in a small institution, that you do set up your own darkroom for copy and other work. You will probably not be able to find a commercial photographer who will treat things as they should be treated, in terms of correct processing. It is something most photographers have never done. They object to it because it would mean changing their whole setup. It usually takes more time and, even if they tell you that they are doing it, you should be very careful to see that in fact this is the case. It would be much better to have in-house processing of photographs if you are producing new material or if you are producing copies that you want to keep for a long period of time. If you are commissioning photographers to take pictures, it would be helpful to have a guide for the photographer which would list the materials to use and describe how to use them properly. You will have to pay more to have it done correctly, but you should be willing to do that.

Fixer that is left on a photograph can combine with the silver image, directly producing silver sulfide. Residual fixer can produce sulver sulfide indirectly by going through a degradation stage, producing polythionates which then react with the silver image. It is vitally important to remove all of the fixer from prints and films. There has been a lot of attention paid to this in microfilm collections, but most commercial photographers devote very little attention to ensuring proper processing, particularly with paper prints. I think it is a safe assumption that negatives in general, excluding nitrate base, will be more stable in the long term than will paper prints. That is due both to the larger grain sizes of negatives and to the fact that they are generally processed more carefully. There is an ANSI standard for the maximum level of thiosulfate, 0.7 micrograms per square centimeter, in microfilm and that is probably a safe level to use for paper prints. There are test methods for ascertaining the thiosulfate level.

It takes a very long time to wash paper prints. I would always use Kodak Hypo Clearing Agent after fixing, with both prints and film. It is very important. There will still be very small amounts of thiosulfate left on paper prints, even after an hour and a half

of washing. It is a general recommendation, with a good print washer, to wash single weight paper at least 20 minutes after treating with Kodak Hypo Clearing Agent. Wash double weight paper at least one hour. Single weight paper washes a lot faster in the initial stages than does the double weight. There are various other washing aids on the market, but a test Klaus Hendriks conducted at the Public Archives of Canada, using various products and procedures, suggests that Kodak Hypo Clearing Agent is better than most.

You can also treat prints with a gold protective solution which coats each silver grain with metallic gold and provides a great deal of protection. That is rarely done, but you see a lot of recommendations for it. It is rather expensive, although not as expensive as you might think. It is something you could do in your own laboratory to things that you want to keep as long as possible.

Sepia or sulfur toning produces an extremely stable silver sulfide image. It is probably the most stable of all photographic images but is not black and white; it is brown and white and that is the major objection to it.

There are a number of residual fixer tests you can use. The simplest one, the Kodak HT-2 Test, is a spot test using acidified silver nitrate solution which reacts with thiosulfate and its decomposition products if they are in the print.[8] If you use this test on a print it will leave a permanent stain, so you should only use it on expendable control prints you are running through your process. Do not use this test on any historical prints.

V. HANDLING, LABELING AND FRAMING

There are some other things I will try to cover very briefly. If you are handling photographs not protected in a transparent sleeve, you should wear cotton gloves, the type that film editors use. Kodak sells these, or at least they did up until very recently. People's fingerprints vary quite a bit in their chemical activity. Kodak had a test for people who were going to work in the camera department assembling shutters. A prospective employee was asked to put his or her hand on a polished steel plate. The plate was incubated under high humidity conditions. Some people produced severe rust. They were called "rusters" and were not hired. The sweat and oils on other people's hands were not nearly as corrosive, so they were preferred for such positions. Many people hate to wear these gloves but I would make wearing them a normal procedure when working in any file. You have to consider how many times the photograph may be handled if it is going to be kept for the next 500 or more years. All of the damage adds up very slowly,

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8. Kodak Publication J-11, Kodak Hypo Estimator. Also described in Kodak Publication J-19, B/W Processing for Permanence. Eastman Kodak Company, Rochester, New York 14650.

but eventually it will severely harm the photograph. Unfortunately, the photographs that get handled the most are the most valuable ones, the ones people want to see and use the most.

Marking prints is a question to which there is no easy answer, except to say that you can safely use common carbon-graphite pencils. We have never seen any damage caused by them. They are much better than any ink I could recommend at the moment. They are not water soluble if the print should become wet or if you have to reprocess it chemically later. The pencil is by far the best thing. Rubber stamps should be avoided if at all possible. Most of you will not be able to avoid rubber stamps. If you are determined to use them, at present we could recommend no ink other than a standard felt pad type of ink. Never use the self-inking stamp and use the lightest impression on the photograph that you can possibly read. The best way to do that is to stamp the pad, stamp a scrap piece of paper and then stamp the print without re-inking it.

Framing prints is another problem that many people have. Unquestionably the best currently available frame is the common aluminum section frame. There are many on the market. These are much better, at least conceptually, than wood frames, particularly bleached wood frames. Again, there has not been any published study on the actual effect of wood on photographs, but conceptually it would not be nearly as good as aluminum. When framing a print, it is best to use spring clips to hold it close to the front. They are very good because you do not have to fill the frame up with cardboard and masonite. Never use cheap materials to back a photograph. Do not use cardboard, masonite or plywood. So far as is known, the safest mount board to use would be 100 percent rag content, neutral pH mount board. It is quite possible that alkaline papers and mount boards could harm black and white photographs. Gelatin, for example, is at its most stable condition at a rather low pH of about 5.5. I would say absolutely do not use alkaline boards or papers with color photographs, particularly Dye Transfer prints.

A well framed print is mounted on 100 percent rag board. Behind that place a sheet of aluminum foil, which serves two purposes. First, it protects the print and mount from fluctuations of relative humidity. It does not totally protect it, but makes the fluctuations very slow (this assumes you have uncontrolled storage conditions). Second and perhaps more important, it is a very effective barrier against air pollutants that are certain to be present, particularly in the home where grease and all kinds of other things come from the kitchen. Cigarette smoke can physically stain photographs and possibly harm them chemically, too. Aluminum foil provides an essentially perfect barrier to that. I am referring to ordinary household aluminum foil, which is cleaned as it is manufactured. It can be cut on a paper cutter and is very cheap.

The print itself should not be permanently mounted and I would advise against mounting prints with any currently available dry

mounting tissue or adhesive. A good print mount has an over-mat or window-mat which serves two purposes: to cover up the border of the print and, more important, to keep the print surface away from the glass so it will not stick to the glass or ferrotype against it. The hinge that holds the two pieces of mat board together is gum fabric tape or Holland tape, as it is often called. You can buy it from TALAS if you cannot find it anywhere else. It is probably the safest thing to use for this application. The print itself is held in the mount by paper corners which are taped on with the same Holland tape. The print can be removed simply by pulling it out of the paper corners. This works very well with all types of prints. Ideally, you leave big borders on prints. If they do not have a border you will have to cut out the corners slightly and then the over-mat will cover part of the picture. Peter Waters, of the Library of Congress, uses a system known as the polyester sling, which involves holding the print between two sheets of polyester secured to the mount. That is one method of handling the borderless print when you do not want to cover any part of it.

QUESTION: Could you use polyester instead of aluminum foil as backing?

MR. WILHELM: You could. I would say it would not be quite as good nor as cheap as aluminum foil.

MR. MAC CLAREN, from the audience: It would be infinitely more satisfactory because aluminum is a deadly element in the presence of any paper.

MR. WILHELM: This is another one of the controversial points. I am aware of that objection. The same objection has been applied to aluminum frames and, there again, you will find quite a range of opinions. Whether or not aluminum foil in this form actually reacts with paper is an interesting question. We do not know. The Kodak envelopes for processed film are laminated aluminum foil-paper-polyethylene. They are also used for storage of photographs. Bob, I take your criticism as being a valid one which proves the need for more research. If you do question it, as Bob does, polyester would be better. From what I know, aluminum in this situation would not react with the paper in any adverse way. I should also point out that Kodak, in a forthcoming publication, suggests wrapping groups of photographs in aluminum foil for long-term storage.

Another question that often comes up is whether it is safe to use Plexiglas over a print, instead of glass. That is another question which cannot readily be answered at this time. If you are sending a photograph on a road show and you are worried about breakage of the glass, then it is certainly valid to use Plexiglas. Plexiglas is an acrylic sheet; acrylics are catalyzed by peroxide catalysts during manufacture and there may indeed be residual peroxide or unreacted monomer in the sheet which could conceivably harm the silver images. Gene Ostroff of the Smithsonian has rec-

commended that Plexiglas not be used. One of the ANSI standards cautions against it. But this, again, is an area where there has been no study. I would say, when in doubt, do not do it. Use glass. Glass is also somewhat cheaper.

If you have to use a tape, the Holland tape previously recommended should be used. I would advise against attaching any tape directly to a photograph. Another tape which could conceivably be used, but the stability data on it is sketchy at this point, is 3M Magic Transparent Tape. For instance, if you were using a polyester sleeve and were determined to tape caption material to the outside, the 3M Magic Tape is probably the best tape that you could use. I cannot tell you whether it would eventually affect the photograph.

MR. MAC CLAREN, from the audience: Any use of 3M Magic Tape is dangerous. The only 3M tape that is suitable for any consideration is the double coated polyester tape that is used for encapsulation.

MR. WILHELM: So you heard that. I mention the 3M Magic Tape only if you are determined to use it.

MR. MAC CLAREN, from the audience: You are wasting your time and destroying your prints. Half our time in archives is spent correcting the work of well-meaning people who use 3M tape.

MR. WILHELM: I said do not use it on the photograph itself. You will find that many archives people are going to use tape to attach things to envelopes, so I say that if you are determined to use tape, that is probably the best one. Would that statement pass?

MR. MAC CLAREN, from the audience: Absolutely not. There is no best one when you are talking about 3M tape. Dirty is the word.

MR. WILHELM: You see some of the problems we have here. [laughter] We have been reduced, really, to a very few things you can safely do to photographs. We do not have a suitable paper envelope. We do not have suitable ink or suitable stamp pad ink that we can be assured is safe to use on photographs. Within the basic outline I have given tonight, I would again emphasize that the best things you can do with your collection are, first, control relative humidity; second, control temperature and third, transfer prints and negatives into safe sleeves, such as the TALAS polyester sleeve. If you want to duplicate the caption information on the original sleeve or enclosure, the best thing I could recommend at the present time is to copy it on a genuine Xerox machine onto 100 percent rag paper. Are there any other questions? Yes, Bob?

MR. MAC CLAREN, from the audience: Where are you going to get 100 percent rag paper with a neutral pH?

MR. WILHELM: That can be obtained from TALAS, allegedly.

MR. MAC CLAREN, from the audience: Six percent of the rag paper made in the United States is of the proper pH.

MR. WILHELM: Yes. It would be from the art supply field, if you can believe their listings of the pH.

MR. MAC CLAREN, from the audience: A satisfactory equivalent would be a wood-pulp base paper of equal analysis.

MR. WILHELM: Could you recommend one? Is there a commercial line?

MR. MAC CLAREN, from the audience: I would not like to recommend Xerox XXV, but it is the only one available. It comes from Whiting Plover and is sold by Xerox. It is 25 percent rag and runs about $4.50 or $5.00 a ream; 100 percent rag is close to $30 a ream.

QUESTION: You mentioned in one of your publications that a glossy finished print is more susceptible to fungus damage than a matte finish print. Would you discuss that?

MR. WILHELM: I did not say that. I did say that you should not use print flatteners. They are all quite hygroscopic and thus will increase the moisture content of the print itself. It is difficult to get a good ferrotyped conventional paper print without using them. Perhaps that is the origin of the statement.

QUESTION: I gather Kodacel envelopes are not available in a wide assortment of sizes. We have been buying the 8x10 and 10x12 sizes.

MR. WILHELM: They are available in a lot of sizes, but most 8x10 prints (except RC prints), particularly if they have been ferrotyped, are larger than 8x10.

QUESTION: Is there a sufficiently wide range of sizes?

MR. WILHELM: Use the next bigger one. Kodak has been asked to slightly increase the size of their sleeves, but for the time being has rejected the idea. It would be good for museum people to write to Kodak about this.

QUESTION: Most campus supply stores, expecially if there is an engineering department on campus, have polyester sleeves in a range of sizes. These are satisfactory.

MR. WILHELM: You also get asked about albums. The best I can advise is to make your own. Go to an art store and get a good quality water color paper, for example, and put the album together yourself. There is no good commercial paper album that I know of.

QUESTION: What about these amateur filing systems for pictures that I have here? This is a Twentieth Century Plastics envelope.

These, which are now quite popular for home use, are adhesive sheets that you put over the pictures.

MR. MAC CLAREN, from the audience: Unless you know the exact analysis of the plastic you are in trouble, because many of them are polyvinyl chloride, which is totally unsatisfactory. If it is an acetate, a vinyl or a polyvinyl acetate, you may be all right. But you literally need a guaranteed analysis of the materials.

MR. WILHELM: The page you have there from Twentieth Century Plastics is plasticized polyvinyl chloride. As you will remember from the ANSI standards, that is specifically prohibited for storage. The self-adhesive page--there are many brands on the market--is also unsatisfactory.

QUESTION: If you tear it off, the picture comes with it.

MR. WILHELM: So that neither of those products would be recommended. We are running late. I will be glad to talk to you individually later. [applause]

STABILITY AND PRESERVATION OF COLOR PHOTOGRAPHS

By Henry Wilhelm

After last night's session on black and white photographs, there were some questions concerning references available to help you care for your collections. I can recommend a few. One is Robert Weinstein and Larry Booth, Collection, Use and Care of Historical Photographs, published by the American Association for State and Local History. You can order it directly from AASLH in Nashville.[1] The second is Kodak Publication F-30, Preservation of Photographs. This is Kodak's first major publication on the preservation of photographs. It contains some material on chemical restoration of photographs and I can assure you that within the Kodak company there is substantial expertise in this field, most of it unpublished at this point. There are two other Kodak publications, small pamphlets. One is J-19, B/W Processing for Permanence and the other is E-30, Storage and Care of Kodak Color Film. Kodak publication M-1, Copying, is very good if you are starting any photographic copying operation.[2]

I believe Kodak recommends that paper products used in contact with photographs have a pH of about 6.5. Hollinger envelopes do not fall into that category. These comments about Hollinger envelopes should not be unduly alarming--I would not rush out and remove all your photographs from Hollinger envelopes. Most historical collections have photographs which are not very well processed to begin with and in these situations you should always be concerned about the weakest link in the system. I assure you that in most historical collections, the Hollinger envelope is by no means that weakest link. Humidity control or original processing may be the weakest link. However, I would say that Hollinger envelopes should never be used for color photographs because of the high pH of the envelopes. Color photographs (for instance, Kodak Ektacolor RC paper) are generally stabilized, as a final processing step, to very low pH, even under 4. The dye-image is most stable at that pH which is why that figure has been chosen. For that reason, you do not want to alter the pH. Never, ever deacidify color photographs. I would make the general statement, never deacidify any photograph. This is quite different from the general rule in other branches of paper conservation. Color photographs may be completely destroyed by deacidification. Dye Transfer prints in particular include acetic acid as part of the dye-mordant system and should remain in an acidic state. You can even smell the

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1. Weinstein, R. and Booth, L., Collection, Use and Care of Historical Photographs, American Association for State and Local History, 1400 Eighth Avenue South, Nashville, Tennessee 37203 (1977).

2. Eastman Kodak Company, Preservation of Photographs, Kodak Publication No. F-30; B/W Processing for Permanence, Kodak Publication No. J-19; Storage and Care of Kodak Color Films, Kodak Publication No. E-30; Copying, Kodak Publication No. M-1, Eastman Kodak Company, Department 412-L, Rochester, New York 14650.

acetic acid on them. If you deacidify them you will probably remove much of the dye.

A question is often asked about slide pages for storage of slides. A polypropylene page is probably the only safe page that could be recommended at the moment; it is on the list of supplies that I handed out.[3] It was produced for the Library of Congress and as far as we know it will not adversely affect color slides or black and white photographs. The Kimac sleeves, which are also on the list, are individual cellulose triacetate sleeves for transparencies--each slide would go into a separate sleeve. These are very worthwhile, particularly in any collection that receives much handling; it keeps fingers off the film surfaces. National Geographic magazine stores its entire collection of many millions of slides in these sleeves. I strongly advocate their use. You can leave them in the sleeve when you insert them in the other pages and it will protect the slides on both sides.

Many of you are not very familiar with the processes used in color photography, so some of this may go over your head; but feel free to ask questions afterwards. As I mentioned yesterday, most of the photography being done today in the United States and Western Europe is color photography. This list shows most of the color print processes in current use.[4] The Kodak Instant Print Film, Kodak Ektacolor paper and Polaroid SX-70 instant prints are the most common. Kodak Ektacolor paper is used for the vast majority of color prints made in this country. The prints you get at the drugstore made by Kodak, even though they are called Kodacolor prints, are actually Ektacolor prints, the same as you would get in a portrait studio. There must be billions of Ektacolor prints in existence.

The introduction of the Polaroid SX-70 system in 1972 was a major milestone in photography because, for the first time, a widely used system that had no black and white capability was made available. You cannot make a black and white photograph with an SX-70 camera. The same now holds true with the Kodak PR-10 instant cameras. Both companies decided that although black and white materials could be manufactured for these cameras, the preference for color is so strong that sales would not justify the expense of manufacturing them. You will notice an almost complete conversion to color in the professional motion picture industry, television films, television news films, home snapshots of all kinds and portraits.

Low cost department store photographs, printed on Ektacolor or similar papers are an example of a system wherein the print is in effect the original photograph. Although a negative is created, it is not available to the customer and is destroyed in a matter

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3. See Appendix B.

4. See Appendix C.

of months. Again, I would like to emphasize the necessity of preserving the original or the only copy of the photograph that you have. The inexpensive studio portrait is really a unique print, in much the same sense that a Polaroid print is unique. The negative cannot be used to make a new print because the processing company destroys it. Also, it is not possible to copy color photographs with anything like the fidelity that is possible with black and white. By the time you have gone through three or four generations, you have severely distorted both color reproduction and the tone curve of the picture. This puts even more emphasis on the preservation of the original.

For display purposes, the only safe means is to make the best possible copy and display that. After that is faded you can make another color copy, if you have the original. You should never display unique color prints for long periods of time.

Wedding photography is another type of photography that has converted almost entirely to color. I had serious reservations about using color at my own wedding, but decided to as I could keep the original color negatives in cold storage and make additional prints. I am sure more stable print materials will be developed in the future. Most people do not have the original negatives from their wedding pictures. The photographers normally keep them for a reasonable length of time. Also, color negatives have very poor dark keeping stability at room temperatures. By the time the print has faded, the negative will probably have faded, too, so a good new print could not be made.

I have a picture of the John Kennedy family, taken early in 1963, which is from the Kennedy Library collection. Kennedy was the first "color" president--the first president photographed mostly in color, at least as far as the Kennedy Library collection is concerned. He was president at the point when most publications shifted to color and color television was growing in popularity. The Kennedy Library collection consists mostly of color negative material. Even though we would think of this as recent, it has already suffered fairly serious deterioration in dark storage. It is no longer possible to make top quality Ektacolor prints from the original negatives. This print is a Dye Transfer print, a process through which it is possible to correct many types of deterioration that color negatives undergo, such as dye fading and color shifts. The Kennedy Library is going to install a sub-zero storage facility in the new building that is under construction. When it is completed, it will be the first major sub-zero facility in the world, as far as I know, that will be used for photographic storage.

When Gerald Ford became president, he hired David Kennerly as his personal photographer. Kennerly is quite well known. He reverted to black and white and one of his reasons for doing so was that he knew his record of the Ford Presidency would be something we would want to keep for hundreds of years. Although he did not

have precise data on color fading, he knew color prints would fade. For that reason, he did not want to spend two or three years on the project, only to have the entire collection lost later. I have a photograph of the Ford Presidency--the sort you rarely see of a President in the White House. It shows Ford and his aides receiving congressional reaction after the Nixon pardon. The reaction was quite poor and you can see that people are not too happy. Kennerly's collection is remarkable, compared with the material that exists of other presidents.

I also have the famous photograph of Marilyn Monroe, taken by Tom Kelly in 1949. This was taken on E-1 Ektachrome, 8x10, the first Ektachrome on the market. It is an example of a picture that can no longer be printed from the original transparency. This picture exists only in printed form, in magazine or book publications and in the form of Dye Transfer prints like mine. I think in years to come you will find that many color photographs will not exist in usable form unless they happen to have been reproduced in a printed publication. Printing inks which are kept in the dark are quite stable (in terms of fading) and they will produce the only surviving images.

NASA has an exemplary program for photographic preservation, particularly in terms of physical handling and the security of the original image. Films that come back from space, referred to as flight films, are immediately processed in Houston. Prior to processing, a determination is made of what kinds of images they will want copies of and internegatives and duplicate transparencies are immediately made from the original roll. The original roll is never cut; it is put back in the can after the copies are made and it is then stored. The original normally is not used again. NASA's aerial photographs are the type of scientific photograph in which the color content is exceedingly important. In one or two thousand years, when people are studying changes in the surface of the earth, such as vegetation patterns, it will be very important to have an unfaded color photograph to make comparisons. The original films that have returned from space are kept in a vault. If a new print or duplicate negative is desired, there must be a consensus among the staff that this is really necessary. Exceedingly careful printing and processing procedures are used to avoid any possibility of physical damage to the original. NASA has a very large budget and can do things that most institutions cannot. The originals of NASA's moon photographs are in moderate temperature cold storage. They are Ektachrome EF films, taken on the surface of the moon. NASA also has made black and white separations from the originals as a back-up method of preserving the image.

The fine art market has also been very concerned about the stability of both color and black and white materials.

Modern subtractive color photographs are composed of three image layers, containing yellow, magenta and cyan dyes. The original

light sensitive system (the system that records the image in the camera) is a silver halide system, essentially the same as ordinary black and white film. However, during processing a color dye image is formed, using color couplers of fairly complicated chemistry. The original silver image is removed, so the final photograph that you see in color no longer has a silver image. It consists of three superimposed dye layers: yellow, magenta and cyan. Keep these colors in mind because I will illustrate what happens when these three colors fade unevenly.

As I mentioned yesterday, silver images are extremely stable if processed properly and are probably not affected by exposure to light. Color images, on the other hand, being organic dye images, are very much affected by light exposure. There is no minimum level of illumination wherein fading will not take place. Fading, in the commonly encountered low levels of illumination, is roughly proportional to the intensity of the light; that is, twice the light intensity will fade the dye twice as fast. With present techniques, it is not possible to restore original color images that have faded. Bleach and redevelopment and other processes that can be used with black and white, cannot at present be used with color. Many photographs from the 1950's and earlier are severely faded.

Some older color photographs have suffered severe fungus damage. This can be avoided entirely by humidity control. I would not use fungicides with color photographs. The effect of the fungicide itself may be detrimental to the photograph.

Color photography in its modern form began in 1935 with the introduction of the original Kodachrome film. Agfacolor film was introduced a year later but is probably the more important of the two films because the Agfa system used incorporated dye-forming couplers. That is the process used in almost all modern color film materials, with the exception of Kodachrome and the instant materials. Agfa probably would have been far more advanced had it not been for World War II, which essentially destroyed the company. Indeed, it might be the dominant firm in the world today, had it not been for the war. In 1936, Agfa was quite a bit ahead of Kodak in color technology.

There are quite a number of other processes in use. The pigment processes, with the exception of electrophotography, are in only limited use in the fine art market. The only current additive screen process is the Polaroid Polavision motion picture process. You may have some of the historical processes, such as Autochrome, which used an additive screen; they are not terribly common in most historical collections, but if you do have them, you should avoid exposure to light. Never exhibit them. If you are copying them, use the lowest intensity light you can, for the briefest time possible. With the additive system, including Polavision motion picture film, you have not only the dye image (which is not the photographic image) subject to dark fading and light fading, but you also have a silver positive image, so you have to be con-

cerned with everything that deteriorates color and everything that deteriorates silver black and white images. It had been assumed that the additive system died out, that it was only an historical relic, until the introduction of Polavision revived it.

The original controlled diffusion Kodachrome was manufactured from 1935 to November 1938, but was used for some years after that. That was quite unstable compared to the improved Kodachrome that was used from 1938 to the present. The current Kodachrome film is by quite a margin the most stable color camera film in the world and should be used for historical applications whenever possible.

Kodachrome was the first process that Kodak had for making prints on a mass scale for the consumer market. It is perhaps ironic that Kodak's first print remains the most stable in dark storage of any print material they have made for mass consumer use. The history of color photography has certainly not been one of continuous progress in terms of stability! There are many design requirements that go into producing a color photographic material, among them speed, accuracy of color reproduction, ease of processing and low cost. Permanence is somewhere quite far down on the list for most manufacturers. I think in the case of the Kodak instant materials, permanence was not on the list at all. This is probably something that will be improved upon in the fairly near future and I think historical groups can have quite a bit of influence on manufacturers in terms of encouraging them to improve their materials.

Most large manufacturers keep the actual stability characteristics of their products secret. Kodak has had extensive color stability research facilities since the early 1960's at least. By keeping stability characteristics secret, they thought customers would not complain as they did not know what would eventually happen to their color photographs. That attitude is changing and I think stability requirements may become a serious market consideration. When that happens, great improvements could be made. I would not underestimate the technological capability of Kodak to make a permanent color material. They have simply never tried to do it. There is some interest in it. In fact, at the May 1978 meeting of the Society of Photographic Scientists and Engineers in Washington, Bob Tuite, Director of Instant Color Research at Kodak, delivered the first extensive paper on color stability of Kodak products that has ever been given by anyone at the company. I think this is perhaps the start of a new era in color.

You may have Ansco Printon prints in your collection. These and the previously mentioned Kodachrome prints are coated on a pigmented film base and are quite easy to distinguish from later prints. They are very susceptible to light fading. Later versions of the Ansco Printon product are quite good in terms of dark storage stability. This process was introduced commercially in 1946 and was the first process that could be used to easily make color prints in the home darkroom.

Kodacolor was introduced late in 1941 and came into general use in 1942. All of the prints made on Kodacolor materials up to about 1954 have or will develop severe orange stains, as well as dye fading; all of them and there are many millions of them. There is nothing that can be done to remove the stain as it is caused by coupler printout. That is, there are color-forming chemicals in the film that will develop this coloration through aging. This is an example of going backwards in stability. The first process, Kodachrome, was far more stable than Kodacolor, by a large margin. As stability was not a market consideration, the better material was abandoned. From Kodak's point of view, the advantage of the negative-positive system (Kodacolor) was that the large exposure latitude of the film permitted it to be used in simple box cameras. The prints were also less expensive to make. These considerations were more important to Kodak than stability.

Kodak also introduced the Wash-off Relief Process in 1935. This was not an amateur snapshot process, but it had essentially perfect dark keeping stability. It is a predecessor of Dye Transfer prints. The current Dye Transfer process is quite complicated and you probably do not have any Dye Transfer prints in your collection. It is used mainly for expensive commercial work; for instance, the "Marlborough Man" advertisements in many magazines. Most of the prints from which the magazine ads were made were Dye Transfer prints. They can cost $300 - $400 each. The commercial advertiser who is going to spend many thousands of dollars on a national ad campaign has few, if any, reservations about spending three or four hundred dollars on a print if it will produce the best quality print for reproduction.

Early Technicolor motion picture film was similar to the Dye Transfer process. The most famous film made this way is probably Gone with the Wind. It has excellent dark storage stability, like current Dye Transfer prints. Were it not for the fact that the early films, to about 1951, were printed on cellulose nitrate base, they would certainly last for hundreds of years. The very first feature length three-color Technicolor motion picture to be publicly released was Becky Sharp. As far as I can tell, using both visual and densitometric analysis, the original Becky Sharp film has not changed significantly since its release in 1935.

Kodak introduced its version of professional motion picture film in the early 1950's. It was called Eastman color negative and color print film and it eventually forced the Technicolor imbibition process off the market. Again, dark storage stability was of little concern to Kodak and all the films made on this material in the 1950's and 1960's have lost nearly all their cyan dye and are now mostly pale magenta.

There are many thousands of films that are unusable, unless you want to see a magenta image. The Technicolor name still exists. It is applied to any film processed by that company; thus, you cannot tell by the name Technicolor how the film was made. The

Godfather films were imbibition printed by Technicolor. They were among the last films imbibition printed in the U.S. Simultaneous with the closing of Technicolor imbibition printing in the United States was the opening of a Technicolor supplied plant in Red China. So China has started to use this process. It has excellent dark keeping stability, in contrast with the Eastman Color in use in this country. It is no understatement to say that the majority of color films made since the early 1950's (and certainly television news films and documentaries) will be lost if they have not been lost already.

The silver-dye bleach processes began in the 1930's with Gasparcolor. This process is currently used with Cibachrome and you will probably see a lot more of it in the future. Kodak had its own silver-dye bleach process prior to World War II, called Azochrome. It was never introduced commercially. It would have been introduced but for the war and would probably be a viable product today. During the war, Kodak decided it was too difficult to process and that it would be best to stick with the Ektacolor type system. Again, that decision would never have been made had stability been an important requirement. The collection at George Eastman House has many early Azochrome prints, all in excellent condition. Ilford in England had a dye bleach process in the late 1950's and early 1960's but you probably will not find any of these in the United States. Modern Cibachrome is also a dye bleach process. It is a viable preservation method. If you do not have cold storage facilities, simply print transparencies onto Cibachrome. If they are kept in the dark most of the time, you will have an exceedingly permanent image that will last hundreds of years.

Recent ads for Cibachrome are, to my knowledge, the first ads to appear in which stability is listed as a major aspect of the product. They compare them to Dye Transfer prints, saying that Dye Transfer cannot match Cibachrome's resistance to light fading. There is definitely an increase in concern about stability and I think the field is on the verge of making significant progress.

Kodak's latest product, Instant Print Film PR10, is the worst film in terms of light fading in existence today. Kodak placed several severe restrictions on itself prior to introducing this product. First, the colors had to look better than Polaroid color, from Kodak's point of view. They had to be more saturated. Second, Kodak had to avoid infringing on any more Polaroid patents than necessary. Polaroid did sue Kodak for a number of infringements, anyway. Third, there was a very strict time table as to when this product was to appear on the market. The company set a date and informed the stockholders of that date. The development of the instant system was the largest investment that Kodak has ever made. Estimates of $175,000,000 or more are given. With all these constraints, Kodak decided that stability was not important. The company view was that most people are more concerned with what a picture looks like ten seconds after it is made, rather than what it looks like in ten or fifteen years. These prints will be severely

faded from typical light exposure in the average home in less than one year. They should never be displayed.

Polaroid for some time advertised that it had relatively permanent colors, but I do not believe you will see these ads anymore. They were based on some early accelerated aging tests that Polaroid conducted and we will talk about the limitations of these tests later. In actual practice, the films performed quite differently from the way they performed in accelerated aging tests.

Probably the first color prints were made by Louis Ducos du Hauron in France in 1877. He used the tricolor carbon process. An example is in the George Eastman House. It is ironic that the first color print ever made is still the most stable of any process and the most recent, Kodak's instant process, is the worst. This is another example of how progress in stability has gone backwards.

Minnesota Mining (3M) tried to market an electro-print process in the 1960's. Advertised as a permanent process, it was a pigment process which could be used with negatives or positives. It employed an electrical system of image formation to control deposits of pigments or dyes. The original patents on it were entitled "permanent color reproduction". The company considered it a brilliant technical success and a total marketing failure. One reason it failed was that it was more difficult to make a print this way than it was using the Kodak Ektacolor process. People were unaware of stability characteristics or simply did not care.

Four-color offset lithography has very good dark keeping stability but, generally speaking, very poor light fading stability.

I think there is going to be a very large gap in photographic history, especially in terms of family albums, between the end of black and white and the development of mass market permanent color processes. Few of the color negative-positive processes such as Kodak Ektacolor (Kodacolor) will survive. The massive conversion to color started in the 1950's. Recent Kodak prints made on resin-coated stock have the further problem of surviving the deterioration of the base, caused by light exposure. I would be very cautious about Kodak's current statements concerning the stability of resin-coated paper. The 125-year claim is, in my opinion, based on incomplete evidence at this point.

Manufacturers, with the exception of Polaroid, have always put a warranty disclaimer on their color products. "Since color dyes may change in time, Kodak will not replace this product for any change in color"; this warranty disclaimer has been used from the beginning. I would submit that the word "may" should be changed to "will". I think one of the things the manufacturers could do (and I think this is one of the most serious areas of negligence on their part) is give customers better information on the characteristics of the product and instructions on how to take care of that product. The manufacturers have been very hesitant to do

that, although they certainly have the information available. They worry that people would become very upset if they actually knew the fading characteristics of Ektacolor portraits and wedding pictures, so they have decided that the best thing to do is simply not talk about it and put this type of warranty disclaimer on the film. That may change also.

We must determine the characteristics of a given color product in terms of both light fading and dark keeping, then decide how long we want to keep it and what storage conditions are necessary to keep it for that length of time. Color materials are not considered archival in the ANSI standards, but that is based on room temperature storage conditions.[5] There is ample evidence that original color photographs stored at sub-zero conditions will outlast black and white materials stored at room temperature. It really becomes a question of how the material is stored, rather than the inherent stability of the material itself. I think future ANSI standards will phrase the archival definition somewhat differently, based on this cold storage factor.

The ANSI standard for comparing the color stability of photographs is undergoing revision.[6] It was based on some early Kodak research. Both Klaus Hendriks and I are on the task group revising the standard. Our first meeting will be in December 1978, in Washington. One of the hopes of the committee is that the manufacturers might all agree on a uniform method of testing color stability. As it stands now, each manufacturer would like to use methods which are most favorable to his own product. If all manufacturers could agree on a system, it would be possible to publish stability indexes for both dark keeping and light fading on the packages of the material. This is something you may in fact see in the next five or ten years. I think this would be a great advance within the field as it would alert customers to the most stable films and it would certainly increase the importance of stability as a marketing requirement.

Of all the material that I presented yesterday and today, there are only two major areas which represent original research. First is the processing and washing of black and white paper prints, on which there is an extensive section in our book.[7] The other is

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5. ANSI, Specifications for Photographic Film for Archival Records, Silver-Gelatin Type, On Cellulose Ester Base, ANSI PH1.28-1976, American National Standards Institute, 1430 Broadway, New York, New York 10018.

6. ANSI, Method for Comparing the Color Stabilities of Photographs, ANSI PH1.42-1969, American National Standards Institute, 1430 Broadway, New York, New York 10018.

7. Wilhelm, H. and Hendriks, K.B., The History and Preservation of Contemporary Photographic Materials, to be published late 1981. Inquiries may be sent to Mr. Wilhelm, 723 State Street, Box 775, Grinnell, Iowa 50112.

color fading, both light fading and dark fading of color materials. The other material came from various sources within the field. As I mentioned yesterday, there are many things that are not now known with certainty. It really is a new field in terms of the research that needs to be done.

As a general rule, the shorter the wave length of light is, the more photochemically active it is and the more damage it can do to organic materials. This is only a general concept when you are applying it to color photographs. Many color photographs have built-in ultraviolet filters. The most important thing I want you to remember is that color photographs fade from visible light as well as from ultraviolet radiation. Simply filtering all ultraviolet light will by no means stop color fading. In many cases, it actually makes very little difference. For display of color photographs, tungsten lights would be recommended with an illumination not exceeding 30 foot-candles. Many would advocate much less than that, but if you are operating on the premise that you should not display color originals anyway, it simply becomes án economic question of how often you want to change the copies. There is no doubt that color vision is markedly improved at high levels of illumination, going up to 200 or 500 foot-candles or higher.

All the materials on the market have a very distinct pattern of light and dark fading. In fact, after doing some work in the field, I could probably identify any sample of material you gave me by its fading characteristics. It is almost like a fingerprint.

Kodak is said to be improving its Dye Transfer process and new versions released in the next year or two may show substantial improvements in dye stability. The most prevalent use of Dye Transfer right now besides the commercial world, is for translucencies, such as those you see at Kentucky Fried Chicken shops. The pictures of fried chicken displayed inside the shop are generally printed by Dye Transfer on translucent film base. They are replaced on a regular schedule because if you lose the yellow dye in a picture of fried chicken, it starts to look quite unappetizing.

Cibachrome is the most stable of any color materials in common use, in terms of light fading. It is not by any means permanent on long term display.

It is important to note that there is often a tremendous failure of the reciprocity law between high intensity accelerated fading and low intensity fading. You can use very accelerated conditions, such as 2000 foot-candles, observe the fading that takes place in a given amount of time and calculate what it would be at lower intensities; but what in fact happens is that fading often occurs far faster at lower intensities than the accelerated test would indicate. There seem to be a number of reasons involved, the most important being oxygen diffusion rates through the gelatin emulsion. Many of the photochemical reactions involved in dye fading are thought to involve oxygen. The high intensities coupled with com-

paratively short exposure times, may cause oxygen depletion at the site of the dye particles, or dye clusters, and that will slow down fading. What we have been most interested in is low level tests which give a more accurate indication of natural keeping. All of this work has been supplemented with actual fading tests in the home. With most materials, it takes a long time to obtain any data that way. One of the joys of working with Kodak Instant Print material is that it generates data so rapidly. You find yourself unconsciously liking it for that reason.

The ANSI standard specifies 70 percent relative humidity for dark storage tests. My early work indicates this would produce very adverse reactions, with Agfa materials in particular, although Kodak materials do comparatively well at that level of humidity. I hope the new standard will specify a somewhat reduced level of relative humidity.

Ektacolor 74 paper exposed to direct fluorescent light shows a marked loss of cyan dye. That is because direct fluorescent exposure has quite a high ultraviolet and blue content and, in the case of Ektacolor paper, the cyan layer sits on top. There is an ultraviolet filter between the dye layers, but that is between the cyan and the magenta, so the cyan remains unprotected. Kodak has formulated the dyes in this way so they fade at a more or less even rate with a typical exposure condition (daylight through window glass). In fact, if you filter ultraviolet completely, the cyan is then disproportionately stable and the image tends to go toward blue-green. Many buildings have fluorescent lights without glass over them, such as this auditorium has. Under that condition, if the picture is not covered with glass, the cyan layer will be disproportionately affected. I would never display prints without covering them with glass. In dark stability tests, Ektacolor is quite poor. If you do not use the stabilizer, which lately has been discontinued in general use by Kodak, the dark storage suffers even more.

One Kodak publication states you can select the two-solution process with no loss of dye stability. That is incorrect and I hope that statement will be revised shortly. It may be that the final stability of the print is determined by the wash water: the more alkaline the water, the worse the stability will be. The cyan dye appears to be pH sensitive. When you get into the high pH region, the dark stability suffers markedly.

Ektachrome 2203 Paper has very poor yellow-magenta stability. It was introduced in 1977 and Kodak has since changed the design. The improved version is said to be better, but I have no samples of it.

In many cases, in the early stages of fading, you will not think anything is wrong unless you have something with which to compare it. You may see marked changes in skin tones and a loss of highlight detail if you compare a photograph to a control strip.

Ektacolor 74 shows severe cyan loss under direct exposure. If exposed under glass it maintains good color balance, although there is considerable loss of density. Visually, it will still look good because it is fading evenly. Dye Transfer samples show very unstable yellow dye. Cibachrome shows very little change in any of the test conditions. Polaroid 668 shows the failure of the reciprocity law more than any other product I have tested. The film's yellow dye fades at about the same rate under 2000 foot-candles as it does under 125 foot-candles. One-sixteenth of the exposure produces a similar amount of yellow dye loss. This illustrates the fact that high intensity tests cannot be used to determine color stability with any assurance of accuracy.

You should never, ever display Polaroid original color prints for long periods of time. Kodak Instant Print PR10 shows very severe dye fading under all conditions. It has a built-in ultraviolet filter in the top layers of the film that covers all the dye layers. For that reason, the spectral content of the light makes very little difference. Even tungsten light produced significant fading in a relatively short time. All of my accelerated tests will be correlated with natural keeping tests and several years from now we will have accurate data on how these tests relate to each other.

Consumer Reports published a review of the Kodak Instant Print system which was quite critical of its fading stability.[8] This was the first time Consumer Reports ever mentioned dye fading in photographs. They used quite crude test methods as it was the first time they had attempted anything like that, but their conclusions were entirely correct. Kodak did not like it and sent a letter out to all dealers stating the company considered the report misleading. They claimed the stability of PR10 prints is entirely satisfactory when such prints are handled, displayed and stored in the usual home or office situation. The company may consider it satisfactory, but severe destruction within one year of typical display does not seem satisfactory to me. The company states: "It should be noted that the performance of a color print exposed to direct sunlight or high intensity fluorescent light is not indicative of its performance when the print is displayed or stored in the usual way." That is technically correct but intentionally misleading. It is not indicative in that the high intensity light would give the impression that it would fade slower than it actually does in normal keeping. That letter was very cleverly written and I am sure a lot of Kodak lawyers were consulted about it. It is probably not an actual lie, but in substance it is. It is the kind of thing that I hope manufacturers will never do again. They could get away with this because color stability information was a well-kept secret within the company. A lot of the people in the research labs were appalled when this letter was issued. I am sure the company will regret it in the future. Kodak's

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8. "Instant Picture Cameras", Consumer Reports, 41 (1976):622-625.

ads say Instant Print is "tough and durable". That is another very clever choice of words, in that the term "durable", when applied to paper, refers only to physical strength, tear resistance and so on, but not to its longevity. The common definition of "durable" that consumers use is quite different. It is synonymous with permanent: firm, stable and so forth (this is from Webster's third edition). I would say that claim of "durable" is actually false advertising, although I am sure Kodak would defend itself by citing the scientific usage of that word in the paper technology field.

Color Xerox reproduction is exceedingly stable, although it is not a true photographic process in terms of tone reproduction. Electrophotographic processes such as this or 3M Electrocolor may, in fact, be the ultimate solution of the problem of how to make a permanent color print.

Here are the recommended print products to use if you are able to acquire new materials for your collection; I have also included definitions of what I would say are acceptable density losses.[9]

Many fine arts museums want to display original color. This can be done if you define an acceptable loss and can predict and measure the rate of deterioration. I have developed a device which can be used to record changes that occur in color prints, both in light fading and dark keeping. Hopefully, all fine arts museums will start using this system. It will allow them to define how much they will permit a color print to fade and they can then display or store it up to the time the maximum permissible fading has occurred, after which it will have to go into cold storage with copies used for display.

Historical collections usually have few reservations about the display of copies; fine arts museums are very hesitant to use them. People want to see the real thing. If you go to the museum to see a Picasso, you do not want to see a reproduction.

Original slides should never be projected for any length of time. You should set up a duplication program immediately if you have a slide library. You can buy a good slide duplicator at relatively low cost. You should never project slides mounted in glass. Under certain conditions, the emulsion will stick to the glass, causing damage; also, glass can break and scratch the emulsion.

Kodak recently published a pamphlet suggesting consumers get their old black and white and color photographs out and display them. I think this is very irresponsible of the company. In effect, they are suggesting the consumer destroy all his irreplaceable old photographs. In many cases, the consumer will not have nega-

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9. See Appendix D.

tives, the display will ruin the prints and he will have no means of making new ones.

Polaroid has not been much better. Regarding their 8x10 system, they state prints "can be displayed in normal lighting in the home or office without concern about fading." That is absolutely incorrect.

At the present time, cold storage is the only method of preservation that I would recommend for color materials.[10] Black and white separations are often suggested, but they are extremely expensive. Unless they are done correctly, with large format and masking, there will be serious color reproduction losses. The stability of the separation film itself, out of cold storage, will not match the original in cold storage. There have been other methods suggested, such as holographic separations, but from an economic point of view, I would not use any of them.

The Smithsonian National Anthropological Film Center in Washington was probably the first major user of a cold storage vault in the United States. They collect anthropological films made around the world; most of them are color negative motion picture films. Dr. Sorenson, who is in charge of the Center, has said the value of the films exists only in the future and that the entire project would not have been undertaken unless a method to preserve them was found. He installed a cold storage vault to accomplish that. A vault of this type can be installed in any existing building; you do not have to build a new one. It can be moved, taken apart and reinstalled. A museum of any consequence will have no choice but to install a cold storage vault and the sooner it is done the better. The new Library of Congress cold storage vault is in Landover, Maryland. At first they were not able to maintain adequate humidity controls. It is the largest facility of its kind, but the temperature is not nearly as low as it should be. The Library of Congress says the reason the humidity control did not work is because GSA handled the contract. That is probably true because the technology certainly exists.

Cold storage is the most important investment a museum can make. I would suggest you consider firing a staff member if necessary to acquire the money for this. It can be used not only for color, but for deteriorating black and white materials, albums that are falling apart, paper products and rare books. With storage at sub-zero conditions, chemical deterioration is essentially stopped.

This final slide shows my wife and her mother with portraits of the female side of the family; six unbroken generations are represented there. I submit that had these pictures been made on present color materials, they would not exist. In other words, were your black and white collections made on present color materials, they would not exist. Thank you. [applause]

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10. See Appendix E.

WHERE TO DO IT?
A PANEL DISCUSSION ON REGIONAL, STATE, AND IN-HOUSE CONSERVATION CENTERS

George M. Cunha
Jacqueline Haring
John J. Newman
Toby Fishbein, Moderator

MISS FISHBEIN: This is the session on "Where To Do It"--a discussion of regional, state and in-house conservation centers. I feel we are very fortunate in having the most qualified people in the country with us to discuss this topic. George Cunha will describe a regional conservation center, John Newman will discuss one state conservation center and Jacqueline Haring will describe a basic in-house conservation center.

Each of the speakers will be discussing the following points: how to establish and operate a conservation center, including funding, staff, equipment, legislation and policies; from whom work is accepted; applications or request forms for work; costs involved; the type of work done and the type of work that would be referred elsewhere and the advantages and disadvantages of the speaker's type of conservation center.

We have allotted time for a question/answer period at the conclusion of the presentations, so please hold your comments and questions until each of the panelists has spoken. We shall begin with George Cunha.

MR. CUNHA: Good morning, ladies and gentlemen. It is always a pleasure to speak with a group of people who are seriously concerned about the alarming deterioration of the records which are our heritage. Regional conservation centers are only a help to the work that must be done. If anything is going to be done to save the records for which you are currently responsible, you will have to initiate it and eighty percent of this work will have to be done by yourself. I think one of the best ways to help you do that is to get you to spend fifty cents to obtain a copy of the pamphlet "Conserving Local Archival Materials on a Limited Budget", available from the American Association for State and Local History, 1400 Eighth Avenue South, Nashville, Tennessee, 37203. That presents my philosophy on "do it yourself, in-house" conservation.

Regional conservation centers are an idea for which the time has come. The idea of an activity, the function of which is to provide the highest quality conservation services for the greatest number of establishments at the lowest possible price, is so logical that these centers should be wide-spread. In reality, it is not easy because of the seed money required, the shortage of people necessary to operate them, lack of money in the users' budgets, the reactionary attitudes on the part of some people in your profession and my profession and management problems.

The New England Document Conservation Center has proven that it can be done. So has the Pacific Conservation Center in Hawaii and the Intermuseum Conservation Center in Oberlin. Others are being established and some institutions that have small conservation laboratories to serve their own needs are thinking of going regional. The New England Document Conservation Center came into being by New England Library Board sponsorship. The New England Library Board picked up the idea from Walter Whitehill and myself when we were working together at the Boston Athenaeum. Seed money was provided by the Council on Library Resources, but the Council stipulated that the Center had to be self-supporting within two years. It also stipulated that the money they gave us to start a conservation center had to be matched dollar-for-dollar by the New England Libary Board. Also important in the establishment of the Conservation Center was a second benefactor, the Merrimac Valley Textile Museum. We paid rent (and a rather stiff rent) for space in the Merrimac Valley Textile Museum, but the Museum Director and his staff were big brothers to us. Without their help, we would have had a very difficult time in the beginning. They kept us out of trouble many times and gave us frequent pushes in the right direction. In the beginning, the New England Document Conservation Center took over the small staff that I had trained when I was moonlighting--while I was working at the Boston Athenaeum and doing conservation for others in a modest way from a laboratory in my own home. I took into the organization with me six trained people. That was of utmost importance because it minimized the problem of finding trained people to start a regional center, which will always be a major consideration.

The New England Library Board's sponsorship was within its authority in accordance with the terms of the New England Interstate Library Compact, which is six identical legislative acts by the six New England state legislatures, authorizing the libraries in the six states to work across political boundaries for matters of benefit to the libraries and to the citizens of these six states. The New England Library Board governs the New England Document Conservation Center and establishes policy. In the beginning, our intent was to be a membership organization with people buying memberships and paying annual dues for the privilege of using our services. We realized right in the beginning that such a policy was a mistake because the people who need us most are the people who have the least money to spend for conservation. As they could hardly spend several hundred dollars a year just for the privilege of getting our services, that was abandoned. The second reason for its abandonment by the New England Library Board was the smaller organizations feared that if we were a membership organization, the big, affluent institutions in New England would have bought in and then dominated us by their size and their wealth. Of course, that was not so.

We have no formal forms for using the service. People come to our door and say "We need help" and we help them on a first-come, first-served basis. We do use many business forms for our day-to-day

in-house management because it is good business. We work primarily for public and private non-profit establishments, but we accept some work from private collectors on a not-to-interfere basis and on a cost-plus basis. We are a non-profit organization, but we charge private collectors a premium for use of our services so we will not compete unfairly with private conservators in the New England area.

The costs for establishing a regional center are rather staggering. The costs I am going to quote amount to about a quarter of a million dollars. That will frighten off most people, but you should not be frightened off because we established a rather ambitious organization. A regional center can be established in one room with two or three people--even one or two people--to do what has to be done. Toby asked me to give some figures and I have taken these from the records of the Conservation Center. Our costs for capital equipment, to begin with, were a vacuum fumigator, $25,000; leaf casting machine, presses and drying racks, sinks, benches, light tables, fume hood and miscellaneous tools and equipment, coming to about $55,000. One of the things we learned in the first five years of existence was that we had to have a microfilm capability, so we put one in just this past year at a cost of $31,000 for equipment. The initial supply of consumable materials was about $5,000.

You need a subsidy to pay the salaries of the people who are doing the work and for rent, heat, utilities, travel and all of the other expenses, until you can become self-supporting. That cost us $145,000 for two years. It totalled $228,000, but that was for a big, ambitious organization that was fortunate enough to have a ready-built staff and could take over an existing establishment (my moonlighting enterprise) with its clientele.

The scope of our work at the Conservation Center includes repair and restoration of books, maps, documents, prints, broadsides, photographic prints on paper, works of art on paper, wallpaper and just about anything you would find in a library, archive or historical society. Our second function is the microfilm capability, which will be expanded to include all microforms in the future. The third function is the surveying of institutions and their collections to determine conditions, propose remedial measures and suggest long-range programs. In essence, our written report to an institution after a survey is a long-range planning document that can be used for budgetary and management planning for years to come. Another function involves teaching and training, such as that which we do at the University of Rhode Island, where we teach a course annually at the Graduate Library School entitled "An Introduction to Library Conservation". We are also working with the Simmons College School of Library Science, in the continuing education program, teaching courses in conservation management. We have in-house training at the Center; we now have two interns studying with us under a National Historical Publications and Records Commission fellowship. At the end of their training

program, which will go on for two or more years, they will be qualified and capable of establishing conservation centers on their own elsewhere in the country. We had an intern from Singapore on a UNESCO fellowship last winter and another intern from the Australian National Library System. We teach short courses for librarians, archivists, historians and library technical assistants in the fundamentals that we think can be done in-house. These courses extend anywhere from two, three, six, twelve or even sixteen weeks, depending on how much the people want to learn and how much they can afford to pay. We conduct workshops in the field, such as the ones we are doing this fall for the National Historical Publications and Records Commission. These are practical, hands-on workshops, teaching people in the field the things they must know about in-house conservation--roll-up-your-sleeves, get-your-hands-dirty, do-it-yourself type of training.

Our emergency function in the field is extremely important. The amount of work in response to calls for assistance after fire, flood, windstorm, plumbing and air-conditioning failures and vandalism was completely unanticipated when we established the Conservation Center five and a half years ago. It is surprising how much of that we do. If you refer to the little tan leaflet describing the Conservation Center's services which was available at the registration desk, one of the inner panels describes this emergency function. We guarantee to be on the scene, anywhere in the northeastern United States, within twelve hours after the time we get a telephone call for assistance. Once on the scene, we help you evaluate the damage, organize a recovery program, get that program underway and stay with you until you can function by yourself. Then we fold our tent and go away. That service is completely free. The New England Library Board considers that service its public responsibility.

The type of work we refer to others is usually museum artifacts (three-dimensional objects, easel paintings and things that are properly museum pieces) that are brought to us for treatment. We generally recommend they be taken to museum conservation workshops so they can benefit from the special skills and expertise of museum conservators. Occasionally we refer some archival materials (public records) to a facility having a Barrow or an Arbee lamination capability, because we do not have such a capability in our shop.

The advantages of a regional center are, first, sophisticated, costly equipment can be made available on a cooperative basis for people who could not possibly afford to have it individually and more people can benefit from the skills of the limited number of conservators and technicians available in the country. Second, on-the-job training opportunities for newcomers in the profession, such as the young people who are studying with us now under fellowships from the NHPRC. Third, our emergency capability. Finally, our field teaching and training capability (what we call our "missionary work") and the training we can provide for others who come to our shop for intensive short courses.

One disadvantage of a regional center is the money required to set it up. It is a costly effort and the administrative costs increase with success. When we were a relatively small organization, we conservators and conservation technicians took care of the administrative work. We now have sixteen people on the payroll, five of whom are administrative personnel who are not earning their own keep, so to speak. They have to be supported by the conservators who are working at the bench. That is a major disadvantage and to me it indicates that there is a certain limit beyond which a regional shop should not go. Another disadvantage is the non-income producing services that are requested of us that we feel we are obliged to provide. We are a non-profit organization, but we are not a charitable organization and we have to support ourselves because we do not receive any financial assistance except for a modest grant from the New England Library Board. We have to earn our own keep, earn our own salaries and the rent. That is extremely difficult. But when people come to the door and say "We need help" and they bring in some of their precious records or books or maps and say "What can we do?" we, of course, help them out. However, every minute that we are working with those people in analyzing, describing, suggesting and encouraging, we are not earning money that we need so desperately to stay alive. The other disadvantages are that a regional center must be run as a hard-nosed business, with constant attention to costs, control, man-hour efficiency, public relations and advertising. This rather goes against the grain of some of the people who work with us because I think they have been spoiled by contact with some of the established conservation centers and some of the facilities in which operating money and salaries are provided in the institution's budget, whether they work productively one hour a day or eight hours a day. That just cannot work in an organization such as ours. Somebody has to be a so-and-so and crack the whip.

As I said earlier, regional centers are an idea for which the time has come; not as panaceas for all of your conservation problems, but as strategically located clearinghouses for conservation which can do the twenty percent of the sophisticated repairs and restoration that is beyond the capability of in-house treatment in your establishments. They can also provide the advice, guidance, teaching and training necessary for you to set up the in-house programs that you must establish in your own institutions to provide the optimum environments to minimize the damage that is always occurring from temperature, humidity and light; and to do the basic cleaning, deacidification, mending and reinforcement which are eighty percent of your restoration problem. The magnitude of the problem is too great for it to be any other way.

If the problem is ever going to be solved, it will be because you librarians, archivists, historians, administrators and curators who are responsible for these records of our heritage take charge and face this responsibility as you face the other day-to-day problems in your work. We professional conservators work with and for you, but you are the decision-makers. As President Truman once said, "The buck is on your desk--you can't pass it on to anybody else."

I would like to take a few more minutes and show you two slides.

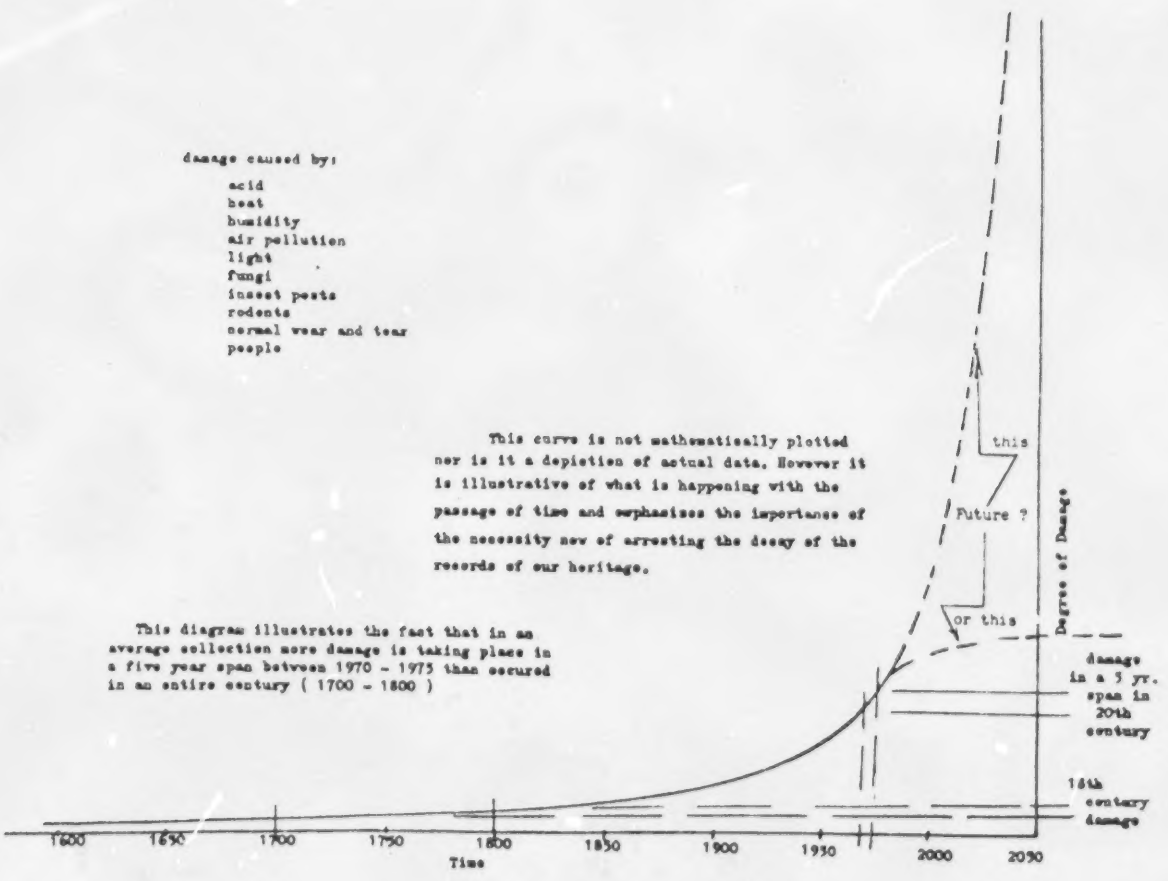
damage caused by:
acid
heat
humidity
air pollution
light
fungi
insect pests
rodents
normal wear and tear
people
This curve is not mathematically plotted nor is it a depiction of actual data. However it is illustrative of what is happening with the passage of time and emphasizes the importance of the necessity now of arresting the decay of the records of our heritage.
This diagram illustrates the fact that in an average collection more damage is taking place in a five year span between 1970 - 1975 than occured in an entire century (1700 - 1800)
this
Future ?
or this
Degree of Damage
damage in a 5 yr. span in 20th century
18th century damage
1600
1650
1700
1750
1800
1850
1900
1930
2000
2050
Time

Figure 1. Deterioration of Library and Archival Materials

The bottom line indicates the date, from 1600 to the year 2000. The vertical line on the right is an indication of degree of damage. You can see that during the first two hundred years of our history, beginning with the Pilgrims and the people who came to Virginia in the early 1600's, this degree of damage is relatively small. In the Nineteenth Century, beginning about 1800 with the advent of industrialization, when people began to pollute the air with emissions from the factory chimneys, this degree of damage began to increase. In the 1900's, when automobiles came in to acerbate the problem, it began to increase dramatically. We have reached the point here in the 1970's where more damage takes place in a five-year period than

took place in a hundred-year period in the Nineteenth Century. You have been overtaken by events. Your predecessors could get away with it, but you cannot. That is why you must do it. If you take charge and decide we are going to resolve this problem, you are going to bend this degree of damage curve down to an acceptable level. If you do not, just as sure as you are sitting where you are today, many of the materials for which you are responsible in your lifetimes are going to be lost beyond recovery.

May I have the next slide, please.

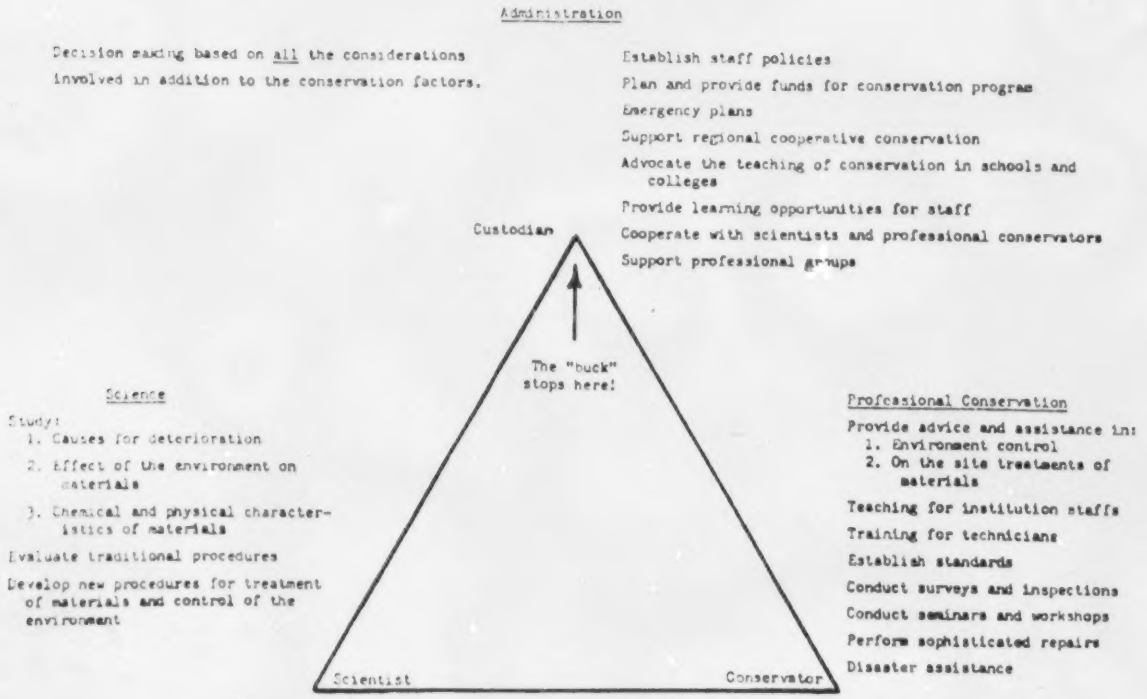
Administration
Decision making based on all the considerations involved in addition to the conservation factors.
Establish staff policies
Plan and provide funds for conservation program
Emergency plans
Support regional cooperative conservation
Advocate the teaching of conservation in schools and colleges
Provide learning opportunities for staff
Cooperate with scientists and professional conservators
Support professional groups
Custodian
The "buck" stops here!
Science
Study:
1. Causes for deterioration
2. Effect of the environment on materials
3. Chemical and physical characteristics of materials
Evaluate traditional procedures
Develop new procedures for treatment of materials and control of the environment
Professional Conservation
Provide advice and assistance in:
1. Environment control
2. On the site treatments of materials
Teaching for institution staffs
Training for technicians
Establish standards
Conduct surveys and inspections
Conduct seminars and workshops
Perform sophisticated repairs
Disaster assistance
Scientist
Conservator

Figure 2. The Tripartite Concept of Conservation

This is the way you can do it. The cooperation between the scientific community, professional conservators and you, the custodian, regardless of your capacity, whether you are manager, curator or historian. You are the people who must make the decisions to get things done. God bless you, you need help.

MISS FISHBEIN: Thank you, George. John Newman will be our next speaker.

MR. NEWMAN: Thank you, Toby. I would like to make two basic points before my actual presentation. First, I am not a conservator, either professional or amateur. I am an administrator. I am not even an archivist as it seems to be anymore, but I am becoming more of an archival administrator, a person who has to design a total archival program in light of the responsibilities assigned me by the State of Indiana. On the basis of that and on the basis of an opportunity in 1974, with the new addition to the Indiana State Library, we had the potential to establish a state-wide conservation facility. We had a 1934 building which was very beautifully designed (it is probably the most beautiful building on our entire state government complex) but totally inefficient, not only for the retrieval of materials, but also in the storage environment. Each department head was given the opportunity to design what he wanted. Fortunately, the Archives won in the area of the conservation facility.

I became State Archivist in 1970; in 1974, I could barely spell the word "conservator", so what was I to do? I tried to survey the basic philosophy in literature regarding paper conservation and discussed needs with professionals like George Cunha and Peter Waters. I established a list of functions that I thought a conservation lab of state-wide scope should perform and I issued a statement of philosophy, working from the very general down to the detailed. This developed into what I have here, a copy of Conservation Lab Construction Notes. It starts out with our basic statement of philosophy, a drawing of how I thought the operation ought to be run, the work flow through it, a list of about 180-190 items necessary for the operation based on the functions the lab was going to perform and a list of where on earth one gets all these materials.

Armed with this and a commitment from my superiors that we were to have a conservation law, we needed to legitimatize this in law. Indiana has a 1949 micrographics law permitting the Indiana State Library to microfilm for itself, for other state agencies and for the general public. We amended that law to include conservation. In order to do this we had legislative hearings. I guess I have a flair for the dramatic or something. Long ago I bought a very beautifully bound Charles Dickens book, printed around the turn of the century. It looked like it was in near-mint condition. The acid deterioration was so great, though, that it could not stand any handling. I equated it to the entire holdings of the Indiana State Library, took a page out of it, clapped it in my hands and let the little pieces drop down to the floor. With the exception of one legislator who said perhaps that is what should happen to what we are doing here today, it passed twelve to nothing and we were able to get this operation into law. We now provide micrographic and conservation services to the State Library, to other state departments at five percent above cost and to the general public at ten percent above cost. This was the beginning. The first part of the battle was being able to outfit it.

Based on discussions I had with George Cunha in August 1976, I tried to establish cost factors for evaluating the work production of the conservation facility. These factors include labor, supplies, overhead and depreciation. As George just mentioned, you have to take into consideration not only the productivity of the people actually working, but you also have to consider the salaries of freeloaders (administrators like myself) in order to calculate the total cost of labor and salaries, fringe benefits and such. We do, at the State Library, have certain budgetary considerations that may not affect a regional operation, such as billing; ours is done centrally. There are various other bookkeeping operations that are not broken down to the department or to divisions within departments.

One thing that is very important to remember in any type of an operation is the spoilage and wastage. We calculate about a twenty percent override for wastage and spoilage of our materials. If you have a large sheet and you cut it and only use a certain amount of it, the rest of it is waste. If you only charge for the amount you use, you are going to lose money. We do try to include this in our budget.

The Indiana State Library is also fortunate in that, unlike operations in other states, we are not charged for certain overhead. We do not pay rent to a central fund and we do not pay for our utilities, with the exception of telephone. We do, however, have a little extra figured in for cleaning, because you cannot have the normal maintenance people come in and clean up a preservation lab. They do more harm than they do good, because they do not understand the needs for cleanliness and various other considerations.

Again, we were fortunate in that in 1974 the capital expenditure for equipping the Conservation Lab was based on the total budget of this new building. I estimate that the total cost to get us started ranged between $25,000 and $30,000. It sounds like an easy way to get started, but we had a lot of other problems. We had an architect who did not understand libraries, much less archives or conservation needs. I probably spent the most time trying to become adequately knowledgeable to train him as to what we needed to have. I even obtained blueprints from other facilities and sent them to him. Probably the most fouled up area, architecturally speaking, was the Conservation Lab. We have had a fumigator in that facility for two years and it is still not hooked up and operating correctly. We have air vents that do not work properly and, as a result, we have not yet been able to function as we would like to function. We are still having our battles and nasty memos back and forth. Ultimately I think we will get what we want because they will not be able to tolerate me any more or they will fire me, one of the two!

Another important factor in our facility was to establish a workload. I first defined the needs of our institution regarding conservation in light of the work to be done by a professional

conservator. That person is to deal exclusively with documentary materials. This is the second point I wanted to make at the beginning of my talk: I am interested in conservation basically for preserving information, not as an artifact. I obviously would want our state constitution to be as conservationally secure as possible and would never throw it away. However, a state archives is based on a volume of information and, so long as we can preserve this information, we are performing our basic responsibility to the citizens of the state. So the conservator will deal exclusively with documentary materials. These are items preserved for their informational value as opposed to their artifact value. General formats include books; manuscripts; photographic materials, such as films; photographic prints and microforms; magnetic tapes, especially audio recordings, electronic data process-generated tapes and other special formats, such as maps, broadsides and prints. While this list is not inclusive, it does reflect anything created for informational transfer, as paper or other base materials for writing or printing, inks and other similar media materials and unitizing materials such as adhesives, boards and binding materials. Excluded from our responsibility are works of art, such as paintings and other items preserved only for their cultural value and physical artifacts of an historical nature. Based on a review of the nature of records within our holdings, most conservation work currently deals with paper materials. We also try to stabilize film formats and other special physical media.

The broad functional mission of the conservation lab, as I have defined it, is to provide the best-suited environment for the storage of documentary materials, the rehabilitation of deteriorating records and the stabilization of non-deteriorating records; to establish a disaster plan; to set standards for testing materials used in records creation and to educate staff members and others about standard conservation and housekeeping practices. Specifically, our overall objectives, then, are preventive care; repair, rehabilitation and restoration; testing, evaluation and standards preparation, especially in light of national programs. Our testing programs are not trying to cut new ground but to apply nationally developed standards into our own operation. We also create a disaster plan; we conduct education and training, which also includes building up a conservation library and, finally, we try to develop cooperative programs on both national and regional levels and also within the state.

These are things to be aimed for and they sound fine on paper, but implementing them into a viable program is another matter. Our conservation facility has been in operation for almost two years and workloads, even under these general mandates, have proved to be excessive. Certain problems have developed in the implementation of our conservation program. The first and primary one is a lack of understanding by the top administrators within the Indiana State Library as to what a conservation program is. They do not understand the need for archivally or conservationally secure items. In federal government, state government or any government, the cheapest

is the best. Obviously, this is not true when you are trying to conserve materials. There seems to be a constant supply problem. Projects are held up because we have to wait to get the bureaucracy to move to get the supplies into our facility when we need them. There is also no understanding by some of the administrators of the different divisions of the Indiana State Library as to exactly what a conservation lab does. For example, one department head has not attempted to understand conservation techniques and refuses to place the responsibility for making conservation decisions in the hands of the conservator. I think this is an extremely important point. George had his triangle on the screen just a few minutes ago and stated the administrator has to place conservation responsibilities in the hands of a conservator. He cannot say "Well, I think I know what is best to do to my records." You have to come to the conservator and say "I have a problem. What do you think is best?" You also have a responsibility to define within your needs the reason you are keeping this material, what values you place on it, how you plan to use it, whether you are going to continue to store it, whether you are going to display it and whether it is going to be handled frequently. Based on the knowledge you provide, you must give the conservator a free hand to develop the proper conservation technique for a particular item. This one division head refuses to do that, even after being told that there are better ways of storing books and items on the shelves. "Well, we have been doing it this way for thirty years and we are going to continue to do it this way." People like this need to be placed in a conservation-storage environment that they are advocating.

Our workload, however, seems to be our biggest problem. The Indiana State Library has existed for 153 years. It is the second oldest non-constitutional office in the state. In that time (153 years), we have collected an excess of 800,000 volumes, over 50,000 rolls of microfilm, I do not know how many other types of microforms and in the neighborhood of twenty-five million individual sheets of manuscript materials. This, as I said, is excessive. Years of non-salutary neglect, no air-conditioning and being located two blocks away from a high sulfur, coal-fired electrical generating plant have all had their toll on our records. The problem of volume is just overwhelming.

Things have been accomplished, however. The conservator has conducted workshops and training sessions and has created a conservation coordinator or coordinators in each of the major divisions of the library. These coordinators have been trained to learn the basic conservation skills, such as how to shelve books properly; how to identify basic conservation needs and how to call these problems to the attention of the conservator; how to do basic book maintenance, including general cleaning; how to flatten and file manuscripts and how to handle photographs and other special media. As Henry said yesterday, you should use gloves and plastic overlays so you do not get fingerprints and other things on particular items. In addition, the conservator has conducted a division-by-divison survey of the library's records, including holdings and specific

conservation problems. Finally, the conservator has conducted special workshops with staff members to acquaint them with such fundamental conservation techniques as dry cleaning, mending and, in some cases, deacidification. These operations are conducted in the conservation lab under her direct supervision, but the staff members are the ones doing the basic work, not the conservator. These workshops and projects are on-going and have been met with various degrees of success based on the emphasis placed on them by each individual department head. In addition, the conservator has, obviously, been restoring what materials she can in light of the budget and various priorities generated.

I, as a department head, see the need for any administrator to be well-versed in the basics of conservation and to know that it is equally as important as acquiring materials or being involved in reference services. I think this educational program needs to be communicated to all levels of administration, from the director of the institution down through immediate supervisors who direct people actually doing conservation work. I think it is in this area that the Indiana State Library is still weak, but the continuing efforts of our conservator gradually are off-setting this program.

In conclusion, I think the concept of an administrator and a conservation program includes first, you must know your records, you must understand basic conservation concepts and the need for their implementation and your need to seek professional help. The administrator must define his needs, know his capabilities in light of staff and budget and plan alternative actions, such as restricting use or access to the materials or generating a microfilming program.

I thank you for your attention.

MISS FISHBEIN: Thank you, John. Jackie Haring will be our final speaker.

MRS. HARING: I am going to talk to those people here, and only those people here, who do not have enough room and do not have enough help and do not have enough time to work on conservation. The rest of you need not listen. I am also going to talk about <u>your</u> in-house conservation lab, not somebody else's or ours. Even if you do not like to think so or have not started to think this way, you are all conservation laboratories and you do have conservation laboratory equipment. Some of this is very, very basic. I do not want to seem facetious, but I thought I would just list some of the things that I think are essential in an in-house conservation laboratory operation.

The first thing you should have is a dust cloth. The second thing you need is a broom or a vacuum cleaner, if you have something you can vacuum. The primary thing for you to think about when you look at a collection is that you do not add any soil or dirt to it. You certainly do not want to spread it out on a dirty or dusty table because it is gritty.

You should have a thermometer so you can try to control the temperature at which the papers are being stored. You should also have a humidistat (sometimes they come together) so you could hope to control the humidity. This can be done by carrying a pail of water back and forth from the humidifier or dehumidifier or by more elaborate means. It is really not beyond anybody's financial capability to control humidity fairly accurately and is better than if nothing is done at all.

You need stacks, preferably not of wood, for your supplies. I think we all know that acidity will migrate, even from a wooden shelf into the collection which has been stored in a Hollinger box above it. Even Hollinger, although it can rebuff acidity, cannot completely stop it from migrating after a long time.

You need light control. I am talking about curtains and mylar sleeves on fluorescent light tubes. The amount of damage done by ultraviolet rays, just from working on the papers, is really kind of frightening.

It is awfully nice if you can have access to a photocopying machine. As Henry told us, if you are handling a lot of photographs, they should not be stored near a photocopying machine. It is very helpful to have a photocopying machine because you can then duplicate fragile materials so they do not have to be handled. You can handle the duplicates, rather than the materials themselves.

I find that moth flakes are a good thing to have around because if I run into a heavily moldy set of documents, I put them into a Baggie with a bunch of moth flakes and let them stay there until I am ready to take them somewhere and have them properly fumigated.

A sink is a good idea, not only to keep your own hands clean, but as you start working with some of the more sophisticated processes, you will need the water. The sink that we have is from a house that was torn down near the campus. Next to it we have a marvelous counter, which was torn out of the same kitchen. It is marvelous because it has drawers and I have shelves on which to keep the few chemicals and supplies that I need.

You need cotton and Q-Tips, so you can test inks, in case you are thinking of deacidifying or wet cleaning or testing colors.

You need a moisture chamber and later today I can show you what this is. It is something you can make yourself. It is a container in which you put tightly rolled or folded documents and let them absorb a certain amount of moisture so they can be flattened and dried flat, instead of breaking them as you try to unroll them.

You need mylar to use for covering certain items.

You need materials for dry cleaning. I like a Magic Rub eraser (a

white eraser you can purchase from TALAS[1]), which I think is marvelous.

An Opaline pad. I happen to have one I can show you later.

I like Absorene Wallpaper Cleaner. Some people do not agree with me, but I think it is all right. You have to be careful when you use it that you do not let it dry out, as it develops crystals which will scratch. You also have to be careful that you do not leave any residue on a paper.

You need very soft brushes for cleaning. Badger brushes are very good.

You need a stapler, in which you can put rust-proof or monel metal staples, so you can keep those papers together which belong together.

You need acid-free bond paper which you can use if you are making notes. If your photocopying machine will take acid-free paper you should use it so you do not introduce more acid to your collection. You need acid-free folders and Hollinger boxes if you can possibly afford them. I think that should be one of the first things you put on your list. Again, so you do not add more acidity.

You need access to a microfilm camera. In many cases it is obviously too expensive to have your own, but if you can have access to one and, especially if you can introduce a firm to the idea of specially developing your microfilm so that it will be more durable than the routine way of developing microfilm, you will be able to protect the materials which are most frequently used.

You need a pail to carry water back and forth.

What can you do with all of this? You can keep your temperatures at sixty to seventy degrees. I was interested to read that for three days at one hundred degrees, or six days at ninety degrees or twelve days at eighty degrees, paper will age twenty-five years. Twelve days at eighty degrees is not so far-fetched. Relative humidity should be kept at forty to fifty percent. If you have any kind of air-conditioning, be sure the filter is changed frequently or at least twice a year. You will be shocked when you see the dirt it gathers.

There should be insect control. If you do not do that yourself, be sure you get somebody to keep working on it so you do not have that problem.

You should be sure to have a big sign forbidding Scotch tape, unless you keep a tiny roll in your own desk for some uses which obviously will not hurt anything with which you are working.

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1. See Appendix B.

Unfold your papers so that not only can they be stored more easily, but the creases will not be increased during storage.

Separate your newsclippings from your documents. We use mylar sheet protectors, which you can buy at any stationery store. Mylar folders are excellent for separating newspaper clippings from other documents when filed in the same folder. The folder may encase either the newspaper clippings or the documents, depending on which is smaller in amount, with the smaller amount being placed in the mylar sheet protector. This, by the way, is a folder which you probably have seen many times. It comes with a black paper inside of it. This black paper is very acidic and should be removed and thrown away as soon as you possibly can get rid of it.

We always unframe all our pictures and diplomas. This is an example of what happens when a wood backing has burned through to the back of a picture. We keep our diplomas flat and in a separate place from the other materials.

Handle photographs and negatives with care. I know it is not an approved way of doing things, but there are times when you have to identify photographs by writing on the back of them. If you do this, use a very soft pencil. We use panes of glass (taped around the edge so no one will get cut) so that a picture can be laid on a very smooth surface and the writing will not go through.

Do not let your workers stuff things into folders or into drawers. If there is not enough room, find another way of making room.

Be sure that your users know how to use the papers that you have in your care so they do not abuse them unknowingly. One time, I saw a student using some of our old newspapers, sitting with the sheets folded as he would if he were riding on a commuter train. Make sure they keep them flat.

Use photocopies as much as you possibly can when you are exhibiting, especially if you have a permanent exhibit. Framed items that are hung, especially in rooms where they are exposed to light, are not going to be very valuable items very long. Sometimes people do not like to look at a photocopy, but you can display a note stating the original is being well cared for in such-and-such an area.

Teach others how to care for their collections, so when you receive those collections, you will have them in better shape.

There are more sophisticated supplies you will need for some of the simpler operations which can be done in in-house conservation labs. For instance, I have already mentioned the erasers and the cleaners you can use in dry cleaning.

You should have a supply of silicone-release paper, heat-set tissue and nylon gossamer web for mending. You can buy all of these from the suppliers.

You should decide on your deacidification route. This, of course, is dependent on whether the inks on your documents are soluble in water or soluble in alcohol. You can even make your own deacidification solutions by using club soda and milk of magnesia. I do not know whether Dick Smith is going to talk about that when he shows his very great Wei T'o deacidification solutions. His are easy because the homemade ones deteriorate unless they are kept cold (you have to refrigerate them), whereas with Wei T'o you just open the bottle and use it. You can brush it, spray it or dip it.

You should have distilled water and rice flour so you can make rice flour paste.

If you really want to get into it, you can build yourself a thymol chamber, which can be used in treating the foxing in papers. Foxing is the little tiny brown dots that appear on papers.

You should have photographic trays in which you have either fiberglass or wire netting to support the documents which you either wash or soak in one solution or another, for some reason. Aluminum trays would do just as well. Be sure they are big enough so that whatever size document you are working with can lay flat in them.

These are a lot of supplies that you may not want to get all at once, but eventually this will give you the capability of doing those jobs which you can do yourselves in your own in-house conservation laboratory. Another responsibility which you must take on yourselves as in-house conservators is the ability to recognize danger when you see it and to know when and where to send it or whom to contact about it. This is where people like George and regional conservation labs come in and are greatly needed.

People have asked whether we do any outside work: We certainly do not encourage it as we have so much work to do ourselves that it is practically impossible to think of doing any outside work. Every once in awhile it is nice to be able to encapsulate a special page from a Bible that someone wants to preserve. If we do that, it is really done as a favor and we do not charge unless we feel it is necessary to help the person maintain dignity. Then it is a very low charge, just to cover materials. We sometimes will show people how to encapsulate or help them dry clean their materials, which, of course, they should do before encapsulation.

What are the advantages of an in-house conservation lab? Obviously, we can take care of jobs we are capable of, without adding to the load of professional conservators. We can act as a teaching group in telling other people how to conserve papers, so that gradually, hopefully, the mistreatment of papers by unknowing individuals will be reduced. The disadvantage, of course, is that we cannot do everything we would like to do. We have people (the charity seekers) coming in asking us to do work we cannot possibly handle. We cannot even do what we would like to do ourselves, but we do feel that we have taken on a job, by assuming a role in our own

laboratories, of taking care of the materials there. If we can help anybody else, that is good, too.

There are certain kinds of "magic"--everyone thinks that somehow, when you start talking about conservation, there is going to be magic, so I just want to mention one thing which I really think is magic. I discovered that if you have a document that you cannot read because the iron gall ink has faded and it is practically impossible to see, if you can get a blacklight or one of the lights that makes the brilliant colors in posters glow, you can hold the document under that light and you will be surprised how the iron gall ink will fluoresce. It is really magic! You will be able to read the item with a lot less difficulty.

There are all sorts of interesting things, but I think we shall talk more about them this afternoon, because our time is up now.

MISS FISHBEIN: Thank you, Jackie. I believe we have time for just two or three questions. Are there any questions for the panelists? If not, then I suggest we adjourn for lunch.

HOW TO DO IT?
A PANEL DISCUSSION ON DO-IT-YOURSELF CONSERVATION TECHNIQUES

George M. Cunha
Jacqueline Haring
Betty Hill
Robert MacClaren
John J. Newman
Richard D. Smith
Alan F. Perry, Moderator

MR. PERRY: I would like to start things off by tossing out a few questions to the panelists, questions they should feel free to answer as they see fit. I hope most or all of them will have something to say on each one of these points. There are several things that we at the Kansas City Federal Archives and Records Center have found ourselves wondering in the year or so that we have been seriously thinking about preservation work. One question is particularly germane to the National Archives and to Bob MacClaren, the Preservation Chemist; it deals with what for nearly forty years has been the old standby, the mainstay of expensive but supposedly superb paper preservation, cellulose acetate lamination. Most of us here, I think, know that in recent years polyester encapsulation has been widely touted as a partial or complete substitution for cellulose acetate lamination. So the question I am throwing out to the panel is--and perhaps Bob would like to begin--does lamination still have a role to play in the conservator's workshop or has it been completely, or largely, replaced by polyester encapsulation?

MR. MAC CLAREN: I think basically the matter is a choice, by the conservator, as to how he proposes to use the article, the manuscript, the map, or what have you in his or her reference work. If it is a simple document, with no colored ink; if it is a simple map, of regular thickness or basic weight and if it is not vellum, not photographic, it is quite simple to laminate it with a combination of Japanese tissue and cellulose acetate about one mil thick, using heat at about 300° F. for more than thirty seconds and less than two minutes. In the context of that type of lamination, wherein acetate and tissue are placed above and below the document, the document is preserved indefinitely. It is capable of delamination through the use of acetone containing a bit of water. There is no damage to the document at any time through the presence of the tissue and ink or the cellulose acetate, but in the context of rough handling, it is impossible to protect a laminated document from damage. In many of the things we are doing, we are encapsulating in addition to the lamination. Encapsulation is providing us with a sandwich that is easily handleable. Dick Smith has just reminded me you have to deacidify the document before you laminate it! You deacidify and then you laminate. The deacidification is accomplished through an aqueous process and I have already qualified my effort by saying there are no acetone soluble or water soluble inks present. If those inks are present,

then I defer to Dick Smith and deacidify with his non-aqueous systems--again, assuring myself that the inks are not acetone responsive. So, if I am looking at lamination, I must look at lamination with the idea that somewhere in the future someone may want to delaminate. I am concerned about acetone and colored inks that may be soluble in it. As to what the assurance is of the age resistance of cellulose acetate, we started laminating in 1956 at the Archives, based on the work of Jim Gear[1] and others at the National Bureau of Standards, using deacidification. We have found no color changes, no discernable damage and no evidence of yellowing in twenty-two years. Mr. Gear sampled all of the original acetate sheeting material that was used from 1956 to date. We ran infrared spectrographic analyses on all of these and there is no evidence of any molecular deterioration or any change in the structure of the acetate sheets.

MR. PERRY: The other panelists?

DR. SMITH: May I add a comment?

MR. PERRY: You are allowed two comments on anything Bob MacClaren says.

DR. SMITH: I have not followed this as closely, certainly, as Bob has, but I do know that in regard to some of the criticisms that have been made about lamination, the documents concerned were not properly deacidified. One method of deacidification that was used by one institution consisted of newsprint, dipped in a magnesium bicarbonate solution, interleaved with the documents. A stack was made and they were left overnight to dry. The "deacidified" documents were removed and then laminated. You cannot deacidify in this fashion. An unstable document would have to be the result. In addition, the proper quality of cellulose acetate was not used in at least some instances. I have seen correspondence in a southern archival institution regarding this controversy. This particular institution was concerned because they had been laminating for many years. They were assured by the Library of Congress' Preservation Office that so long as they had followed the practices recommended by Mr. Barrow or those suggested by the National Archives (first rate procedures) that they had achieved archival permanence.

MR. MAC CLAREN: The Arbee Corporation[2] has been advertising a laminate system involving a polyethylene coated polyester; this is not lamination but a combination of lamination and encapsulation, wherein you cut a sheet of regular polyester the size of the document and place it top and bottom, like the bread on the top and

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1. James Gear is the Director of the Preservation Services Division, National Archives and Records Service.

2. The Arbee Corporation, 6 Claremont Road, Bernardsville, New Jersey 07924.

bottom of sandwich meat. Above and below that you place a polyethylene coated polyester sheet larger than the whole mix, which you then heat and press. The polyethylene adheres to the polyethylene that faces it and you have sort of an encapsulated/laminated thing. It is easy to take apart, it is expensive to do, but it works. If you take regular polyester and try to laminate it with heat, you are going to destroy your document because you are going to heat it up to 400° F. or more in order to get the material to flow.

MR. CUNHA: I think the question was, "Does lamination still have a place in the conservation picture?" Definitely yes, but Dick and Bob have been talking as if every person here has a $10,000 laminator in the basement of their place of business. Well, of course you do not. If the point is that lamination is just another preservation technique, I definitely agree that there still is a major requirement for lamination and we should have these machines available around the country. I know of one archives out here in the Middle West in which there are tens of thousands of census cards that have become so acidic and brittle that they are dangerous to handle. Even if they were deacidified, they have to be reinforced one way or another so they can be used by people who refer to them day in and day out. I think that is an area where lamination should be used. But it is not---

MR. MAC CLAREN: If I might comment?

MR. CUNHA: Yes.

MR. MAC CLAREN: The Xerox or Kodak copying machines, through the University Products concern up at Holyoke[3], have a "statically adhesive" card setup where you can put library cards that are dog-eared on a sheet and run off copies on library card material of a special design. I understand the Library of Congress has put in a "9700" that turns out thirty to sixty thousand of these sort of things a day. My suggestion is that you look at this from the economic viewpoint and, rather than make a major decision in trying to save a card or document that is very tired, you might consider electrostatically copying it on a more or less permanent substratum.

MRS. HARING: I would just like to say that I like the Barrow processed items. We have been lucky enough in our archives to have had some of our most precious documents Barrow processed and I believe that because they were done professionally, they are going to last without any problem. However, there are many things which do not quite deserve this kind of treatment and, for this reason, I think encapsulation within the lab (the in-house lab) has its place. It is slow, even after you have done a good many, but it means that you do not have to expose the document to any heat whatsoever, which is another thing that I like about encapsulation.

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3. University Products, Box 101, Holyoke, Massachusetts 01040.

MR. NEWMAN: When I was setting up our preservation lab I went to encapsulation, rather than lamination, basically for the reasons already mentioned, but also for another one. In addition to visiting George Cunha, the National Archives and the Library of Congress, I visited about ten or twelve state conservation facilities. Some of those that were using the lamination process probably did not know what they were doing. As a result, they had no way of testing the results. Taking into consideration the cost factor and various other things, added to the fact that we may or may not find a person who knew what he was doing regarding in-house lamination, I decided on encapsulation. I did not dismiss lamination, however; I felt that if things were to be laminated I would send them to professionals like the Barrow Lab.[4] I would like to ask Bob a question, if I may. You said from 1956 onward you kept samples of the acetate. Are these samples before or after they went through the heat process?

MR. MAC CLAREN: Both.

MR. NEWMAN: They are both? The heat has not caused any degradation?

MR. MAC CLAREN: No. Nor catalytic snowballing.

MR. NEWMAN: Thank you.

MRS. HILL: Each type of encapsulation has its place. As Jackie has said, polyester encapsulation is appropriate for labs that are not equipped with a Barrow machine. However, it would be impossible to encapsulate a book, so unique volumes must be cared for by the Barrow system, using the laminating machine. They will last, when properly done and bound and they can then be put back into service.

DR. SMITH: One point that might be pertinent with regard to lamination is that we have limited the discussion to the type of process produced either by Arbee or by Barrow. There is a third type, manufactured by Ademco, an English firm.[5] It is marketed in North America and I know it has been used for at least five or ten years in the Public Archives of Canada, with good results. I would think the cost of such a press would be somewhere on the order, perhaps, of $1,500-$2,000. I am not sure of the amount, but it is reasonable as compared, for example, to a Barrow press laminator, which would probably run on the order of $20,000.

MRS. HARING: I think there is another thing that really is not

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4. The W.J. Barrow Research Laboratory, Historical Society Building, 428 North Boulevard, Richmond, Virginia 23221.

5. Ademco Ltd., Lincoln Road, Cressex Estate, High Wycombe, Bucks, England HP12 3QU.

laminating and is not encapsulation, but still achieves the same end. That is the process you use in backing or mending brittle papers, using heat-set tissue and nylon gossamer web. It will protect the item and will give you the same firmness that you get from encapsulation.

MR. CUNHA: This nylon gossamer web, which I will demonstrate later on this afternoon, is a very satisfactory way of reinforcing embrittled book paper, because it is much more flexible than the Barrow process. See--you can do that to it [sound of gossamer web reinforced paper being grossly mistreated]. But what is even more important, you just cannot tear it when you try. That is how good this stuff is! And it is still readable! [laughter] The Barrow lamination is still a vitally important part of your work if you are fortunate enough to have access to one of the machines, but you have other alternatives as well. I think many people say that because something new comes along, the older process is automatically put on the top shelf. Well, that is not so. You are just being enriched with more and more alternatives.

MRS. HARING: And you can do it, George, with a household iron set on low.

MR. PERRY: One more comment on lamination and encapsulation.

MRS. HILL: I would like to add a plus for the Barrow lamination. Should you have a plumbing failure and your books become wet (this happened in one of the universities in Illinois), the cockling of laminated pages will be minimal and the drying process will be minimal. Daub with a paper towel, wipe and then spread (fan) to dry. They had to be rebound in the case in Illinois, but there was no distortion of pages or of print and there was very little cockling of any of the pages. So this is a plus for lamination, should you be unfortunate enough to have a mishap of this kind.

MR. PERRY: In talking about encapsulation, lamination, or nylon gossamer, we are talking about taking a single document and working on it individually. Whichever process is used, it is a labor intensive operation. You have to be devoted to the individual document. I think there is another level of preservation--what we have come to call environmental controls. What sort of priorities would the panelists suggest? We are all short of money. What are the most important things to do with our money? At the National Archives branch in Kansas City, we tend to think that maintaining temperature and humidity controls is terribly important. We would also like to find some practical method of mass deacidification.

MR. CUNHA: Prevention is one of the things that we stress at the Conservation Center, not only in-house, but as part of our intensive teaching program. To answer your specific question, the order of importance, in my mind, is temperature control and humidity control (which are synonymous; you cannot have one without the other--you begin to fiddle with the temperature and the humidity

rises and falls accordingly). Environment control, as we prefer to call it, includes temperature and humidity control and controlled light. Next, we emphasize storing materials in acid-free folders and boxes as a holding stage until you can get around to the cleaning and deacidification. As long as they are in highly acid-contaminated standard office files damage continues. Every day they are in contact with an acidic cardboard file folder, they become more contaminated. Third, cleaning and deacidification, which are synonymous, because if you take a document that is heavily coated with surface soil and put it in a deacidification bath, you are going to carry that dust and soil right down into the paper where it is going to remain forever. You cannot deacidify without cleaning first. Lastly, simple mending and then either lamination by the well-known Barrow technique or encapsulation or nylon gossamer web. Those are all things, by the way, with the exception of the expensive Barrow laminating process, that can be done in-house, by yourselves, with a very modest investment in materials and equipment.

MRS. HARING: I think that order of priorities is exactly the way I would have drawn them.

MRS. HILL: I agree.

MR. NEWMAN: I go along with that, except I would also emphasize, in your environmental controls, the role of pollutants in the air.

MR. CUNHA: I concur.

MR. MAC CLAREN: I am very, very much in agreement with George, but we have had some decisions to make in some of the regional archives and presidential libraries where they have thousands of beat-up old metal-edged boxes and there is nothing wrong with them except the pH is wrong. We are putting into those boxes office papers with a pH of 4.5-5; the boxes are pH 4.5 or 5 to 5.5. We cannot see any justification for buying new acid-free boxes at this point until we have changed the great mass of material that is going to be in those boxes. There is no reason to put one thousand sheets of paper with a pH of 4.5 in a nice, brand new pH 9 box. If we have a deacidified paper that we are not going to laminate or encapsulate, there is no question about putting it into a high pH box; but if you have material that is of a pH below 7, from our viewpoint in both the photographic area and the office copy area or typewriter paper area, we do not see any justification (until we know more about it) to buy high pH boxes.

MR. CUNHA: Again, Bob is absolutely right, except---[laughter] If you invest in good folders and boxes, then you know you have acidic materials in good folders and boxes. That is an incentive to go out and do your deacidification! There is a little psychology in that.

MR. MAC CLAREN: Getting back to the very beginning of George's comments: as a chemical engineer and a pseudo air-conditioning

specialist, I take great umbrage at the attempts made by some organizations in Washington to air-condition things. I spoke at the Nashville meeting of the Society of American Archivists in this context. I am an anti-low-bid person. I have seen bids for the repair of something in the air-conditioning system come in at $10,000, $100,000 and $200,000. The ten thousand dollar man is a liar, the hundred thousand dollar man is probably incompetent and I might get what I want from the two hundred thousand dollar man. You are kidding yourself if you take anything but the best. Competitive bidding is the greatest fraud that can be visited upon your archives under these circumstances. You are totally wrong to accept anything but the best. In that "best" you want instrumentation that may cost almost as much as the installation itself. If you have a hundred thousand dollar installation, I would spend a hundred thousand dollars on the instrumentation, with computer programmed control, because that is the only way you are going to control your setup.

QUESTION: Is this purely a function of bidding or is this partially a function of improperly written specifications and the acceptance of shoddy work?

MR. MAC CLAREN: You have hit the three faces of it. The specifications can always be worked around. It is possible for a bidder to bid against specifications, claim that he can deliver the goods and convince an incompetent procurement officer that he can do it with the finest specifications in the world. You must write your performance needs into the specifications.

MR. PERRY: We have raised the question of deacidification and a recent report of a National Archives preservation study task force points out that among the few promising technical advances in the art and science of archivery in the last few years is work on mass deacidification.[6] How do you deacidify documents without doing it one-by-one-by-one? I would like to ask first, how important is deacidification (the consensus I have generally heard is that it is vital in the long run) and second, what about some of these new methods of mass deacidification? We also might want to raise the vapor phase deacidification (VPD) question, with which I understand George Cunha has done some work recently.

MR. CUNHA: I do not think there is any question about how important deacidification is. It is mandatory with 95 to 99 percent of your material. You must and that is it. I have heard some people in my profession claim--and I think it is absolute rubbish--that we should not encourage people like yourselves (neophytes and nonprofessionals) to deacidify because it is such a complicated thing, beyond your competence. I become enraged when I hear that because it is elitism in the worst sense. Of course, the

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6. National Archives and Records Service, unpublished report of preservation study task force, 1978, Section II, page 7.

people who advance these arguments come up with all sorts of scientific reasons why, but I would say if anybody tells you that, just mark them down in your book as a damned fool and go on from there [laughter]. What are the available techniques? The principal techniques for deacidification (and the ones you should use whenever possible) are the Barrow two-solution process; the one-process magnesium bicarbonate system, which was developed at the National Archives shortly after the Barrow process and Dick Smith's Wei T'o process. Any one of those will give you absolute deacidification and positive buffering against contamination in the future. You also have the so-called milk of magnesia and carbonated water process which Dick Smith originated quite a few years ago. I think he created it as a lark, but all of a sudden he realized he had done something pretty good! I do not know why it is called Cunha's Cocktail. It should be called Smith's Cocktail because it was Dick's idea. I am damned with it because I recommend it. I defend it because there are times when you only want to do one or two small documents and the Barrow process takes a little bit of an investment. The Cocktail requires only a quart bottle of soda water and a milk of magnesia tablet or magnesium carbonate---

MR. MAC CLAREN: Whoa! The tablet will not work! It has magnesium sulphate in it.

MR. CUNHA: All right. Magnesium hydroxide or what have you---

MR. MAC CLAREN: Phillips' Milk of Magnesia, unflavored, one and one half ounce per cocktail.

MR. CUNHA: And if you have any left over you can use it for your party on Saturday night. [laughter] This next point is controversial and I am deliberately saying so. Dick and I have been great friends for years and will be friends until the day we die, but we will never agree on the vapor phase deacidification technique. I firmly recommend it <u>when</u> you cannot use the Wei T'o or Barrow processes. It is <u>not</u> as good as those processes because it is a mild deacidifier to begin with and it has absolutely no buffering capability, but there are times when your document or piece of paper cannot be immersed in water and the inks or the colors are sensitive to freon and the alcohols. You have no alternative. The argument that people use against cyclohexylamine carbonate is that it is dangerous to your health. Well, I am not a scientist and I cannot argue from a scientific point of view; I am not a doctor of medicine, I cannot argue from that point of view. I like to think that I can take the available evidence and evaluate it and arrive at my own decisions. I think it is safe to use if you use it with precautions, just as you use precautions when you drive your automobile. Gasoline will kill you if you do not take sensible precautions. There are people who claim that it is carcinogenic. If anybody is interested, I have a letter here from the Department of Health, Education and Welfare Division of Cancer Cause and Prevention, which examined the evidence. It is not based on studies in their own laboratory but on

examination of the evidence. The conclusion they arrived at is that it is not a cancer-causing drug. You have five or six alternatives to use. Whenever you can possibly do so, use the Barrow process or the National Archives' one-solution process or the Smith process. If you cannot use one of them, use one of the others which is less effective but also useful.

MRS. HILL: I have always suggested to genealogists and small historical societies that do not have much money or much help, that if their document is water resistant, if the inks are water resistant and have no colors (you always test your inks first), if they are not water soluble, washing them in plain hard water is better than nothing.

MR. CUNHA: That is right.

DR. SMITH: I think I had better summarize, going back to the previous question, because it is useful. Where air-conditioning exists, particularly in large institutions, have someone on the staff who is competent as an engineer to operate the system and to make sure it is working. Otherwise all sorts of sad things, as Bob reported, are almost certain to occur. With regard to the priority of things, I would like to suggest that the comments of the panel a moment ago were absolutely valid, but if you look ahead a few years to the time we have a mass deacidification process, regardless of how it will come, whether it is something truly unheard of today or not, it is certainly going to occur. At that point it may be desirable to rethink temperature storage over long term periods. It may become less expensive to operate with storage conditions suitable for people to work in and to apply the additional cost to mass deacidification, rather than to cold storage. With regard to the types of treatment, I would certainly concur with the thought that the Barrow process, the Gear National Archives process and my own work are the recommended choices. I would like to suggest either the Gear process or my own, not because they do a better job of deacidification than the Barrow process, but because they use magnesium as compared to calcium. The benefit is that the magnesium will tie up some of the trace metals like iron, copper and cobalt (cobalt comes from natural growth of the tree). These trace metals catalyze oxidative reactions and this is particularly important with groundwood or unbleached paper fibers. You get a little more in terms of protection from those two choices. With reference to the Cocktail, a copy of the pamphlet The Use of Magnesium Bicarbonate Prepared with Magnesium Carbonate and Club Soda to Protect Paper Against Aging will explain the procedure.[7] With reference to George and cyclohexylamine, we have disagreed for more than ten years. So far as I can tell you, the vapor of cyclohexylamine carbonate falls in the class of poison

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7. Richard D. Smith, The Use of Magnesium Bicarbonate Prepared with Magnesium Carbonate and Club Soda to Protect Paper Against Aging (Park Forest, Illinois: Wei T'o Associates, Inc.; revised ed., 1976)

gases. The technical data related to the question of whether or not it does an adequate job of deacidification was reported by McCarthy in 1969.[8] The 1970 articles by DuPuis et al and Smith discuss the toxicology of cyclohexylamine carbonate and its hazard potential in archival use.[9] My recommendation is to obtain the information and make up your own mind. One of the questions that people always have with regard to toxicology and working conditions is, how in the world do we decide what is safe and what is not safe? We have all heard of OSHA and the problems it causes people who operate with chemicals. The Federal Government has now funded, through governmental offices of the various states, the National On-Site Consultation Service, which an administrator can obtain merely on the basis of a request. This is for non-state, non-federal institutions. There are no penalties involved. They will inspect your working conditions, make tests if necessary with regard to gases, solvents and so forth and tell you whether or not your conditions comply with OSHA standards (which is what we really want to know). On this list are the addresses of the places which will do this in the states of persons attending this conference.[10]

MRS. HARING: I would like to mention something I discovered the other day that I had not realized and that is the difference between the units of acidity. One unit is ten times greater or smaller than the next one. By this I mean an item that shows a pH of 5 is ten times more acidic than one which shows a pH of 6. Like being pregnant, there is no such thing as being "a little bit" acidic. When you get a little bit more up the scale you get an awful lot more up the scale. You cannot settle for very little; you have to do a good job.

MR. MAC CLAREN: I think we have sort of hedged on the subject of mass deacidification. We really cannot handle it by means of the three methods that are under discussion. Mass deacidification, to me, means taking the book and deacidifying in in toto. It cannot be done at the moment. The Library of Congress is funding a grant at General Electric where they are using diethyl zinc on a mass basis. I have not seen the data and do not know anything about it. The morpholine system, which was promoted by the Barrow Laboratory, has fallen into a state of disuse and nobody is handling that on a mass basis. I do not know where I would go if I wanted to have a thousand books mass deacidified.

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8. Paul McCarthy, "Vapor Phase Deacidification: a New Preservation Method", American Archivist, XXXII, 4 (October 1969).

9. Richard D. Smith, "New Approaches to Preservation", Library Quarterly, 40 (January 1970); R.N. DuPuis et al, "Evaluation of Langwell's Vapor Phase Deacidification Process", Restaurator, 1 (1970)

10. Contact your state department of public safety or equivalent agency or your regional OSHA office for the address of the inspecting unit within your state.

MR. CUNHA: I happen to know a little bit about this diethyl zinc process that the Library of Congress has developed. The tests have determined that it is quite a good deacidifier, but it puts few buffering salts in the paper and is extremely dangerous. It is something that you could never hope to do except with very sophisticated equipment and with highly trained technicians and engineers to operate it. However, if we are ever going to get on top of this mass deacidification problem, it is going to be because we can treat thousands of books at a time. Just last week I was in a library in upstate New York which has 1500 linear feet of rare books in the rare book room. It is a medical library and these are primarily Nineteenth Century and early Twentieth Century publications. The cost of deacidifying by the Barrow technique or spraying with Dick Smith's Wei T'o or anything else would be very high and the time involved would be great. We are negotiating with the General Electric Space Center to have these mass deacidified and will probably have some information for you in six or eight months to a year. What is encouraging to me is that this equipment at Valley Forge, Pennsylvania, takes 700 linear feet of books at a time. That is a lot of books. It brings the cost down to something on the order of a dollar and a half a book, which is within reason. Another point is that Dick Smith is working on mass deacidification in Canada. The work of the Barrow Laboratory, by the way, is being picked up by an outfit in New York that is trying to commercialize it. To summarize, all you can do in your deacidification efforts now is mark time and create a holding action---

MR. MAC CLAREN: For mass deacidification.

MR. CUNHA: Yes, until some satisfactory method of mass deacidification is perfected. The small library I mentioned (it is in a major university in upstate New York) said they cannot pay for the zinc process themselves; they have to go out and get some benefactor to come up with thirty thousand dollars to pay for the mass deacidification of fifteen hundred linear feet of books. They know that if they do not do it, this medical history library will be a memory and not an important reference collection in fifty years.

MR. PERRY: We have a couple of comments that the panel members wish to toss out to each other.

MRS. HARING: I think we ought to repeat what Henry Wilhelm said, that photographs should not be deacidified. Is that correct, Henry?

MR. WILHELM, from the audience: At the present state of knowledge.

MRS. HARING: When we talk about mass deacidification, we have to consider the fact that we also have photographs in our collections.

DR. SMITH: There is a project that has been ongoing at the Public Archives of Canada for four years now to solve the problem of mass deacidification. It is based on my work at the University of Chicago.

We are going to be installing the second generation of equipment in the next month or so. The day of judgment for me, after 15 years of work, is almost at hand. We believe the process will work. What remains to be seen is how well it will work. The project thereafter, assuming all goes as planned, will move into its second phase, which is application of the technique (an adaptation of the regular Wei T'o, but using liquified gases and pressure vessels) to strengthen papers by impregnating a resin bonding agent. There are some additional chemical treatments also included in the second phase because we know that deacidification, although eliminating the major cause of deterioration in libraries, is only one of the mass treatment problems archivists must solve. If you want to keep records for a long period of time, you must attend to those other causes of deterioration. Sometime early in the new year, rumors should float around as to whether I am going out and digging a hole and pulling it in over my head, or whether I will pop up like a jack-in-the-box and feel that the last few years have been very much worthwhile.[11]

QUESTION: We were talking about mass deacidification. One of the handouts mentions Interleaf vapor phase deacidification. It sounds very safe: all you do is stick some paper in books and you put them in a plastic sack. The cost that they estimate sounds like about two dollars a volume, which is the cost of the dangerous vapor phase zinc process. Why should we do that when we can just put them in plastic bags with the specially treated papers?

MR. CUNHA: If you put any value whatsoever on your time, it is going to be a lot more than two dollars a volume for the Interleaf. Interleaf is a VPD cyclohexylamine carbonate process that I advocate. If you send them off to a mass deacidification chamber, it means putting the books in boxes, having them properly loaded by your own staff and turning them over to the contractor; then they are his until he brings them back. So you have this labor thing to consider. By the way, I was in England a few weeks ago at the Robertson Laboratory, which makes that paper that you have in your hand.[12] One of the big objections is the fact that the chemicals with which the paper is impregnated gets on your fingers. Because of the charges and countercharges that have been made, people are a little bit unhappy about handling it. Currently, it is a five-inch by eight-inch plastic envelope in which the loose paper is inside a porous paper in compartments. The Robertson Laboratory has designed a new packet, so when you buy it in the future you will rip off the plastic envelope, place the paper packet in the book and forget it. We used the Interleaf twelve years ago

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11. Preliminary results of this research are described in Richard D. Smith, "Progress in Mass Deacidification at the Public Archives", Canadian Library Journal, XXXVI, 6 (December 1979).

12. Interleaf VPD Paper from Interleaf, Inc., 2300 East 26th Street, Minneapolis, Minnesota 55406.

at the Boston Athenaeum, when it first came out. We did several thousand books with that very paper you have in your hand. We interleaved them, put them on the shelves and forgot them. Most of them are still on the shelves with the interleaving paper in them. They are books that are very rarely used. When anybody asks for one, the attendant removes the VPD papers, throws them in the wastebasket and hands the customer the book. I wish VPD was a better deacidifier and I wish it buffered. It is useful as a holding action and that is all I can say.

MR. PERRY: Do any other panelists wish to comment on Interleaf?

DR. SMITH: I would only refer you to the article by Mr. McCarthy in The American Archivist and you can look at the references in my January 1970 Library Quarterly article. Or you can look at De Puis' 1970 article in Restaurator.[13] Go to these sources for information. Investigate the deacidification agent cyclohexylamine and its properties. Lastly, check with your insurance company and your local zoning authorities before you decide whether or not you want to use the VPD process.

MR. CUNHA: Remember, you make the decisions.

QUESTION: We had somebody laminate some pictures from a newspaper and they were about five inches by seven inches. When we got them back they were curled up tight. What did they do wrong, or what did we do wrong?

MRS. HARING: Was this the actual picture or the newspaper?

QUESTION: The newspaper clipping.

MRS. HARING: Was the lamination too thin? Did they---

MR. NEWMAN: Could it have been done only on one side?

QUESTION: No, it was two sides--no, wait a minute--I am not sure.

MR. MAC CLAREN: I think John has hit it.

MR. NEWMAN: Yes, I think it might have been only on one side.

MRS. HILL: That would cause it to curl.

MR. NEWMAN: Possibly.

MR. MAC CLAREN: With the proper lamination, using the proper tissue and the deacidification before it, the stresses are uniform and the laminate should stay flat.

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13. See footnotes 8 and 9.

DR. SMITH: I would wonder if the paper might have been damp and been somewhat larger when it was laminated. Subsequently, when it dried it shrank, which caused it to curl.

QUESTION: I was wondering if all lamination did that?

CHORUS FROM THE PANEL: No, no, no!

DR. SMITH: No, something was peculiar.

MR. MAC CLAREN: You could delaminate it using acetone and a little water (five percent water) if there is no soluble ink in it--no colored ink--and go back and have it done properly.

QUESTION: Thank you.

QUESTION: I think there needs to be some clarification of the idea that there are many commercial lamination processes that are completely unsafe that people would come in contact with. This is very possibly the kind of lamination process that she was talking about, not cellulose acetate and tissue and not a proper process at all. I think it is very important to distinguish between types of lamination processes.

MR. CUNHA: I apologize for talking so much, but I have had recent experience with this same problem. All of the county records in one of the states here in the Midwest, not too many years ago, were "laminated"--and I put that in quotes--by a firm that went around with its equipment in the back of a van. They claimed to be doing Barrow-type lamination with deacidification. It was an absolute fraud! There is no other way to describe it. Unfortunately, this county records office is now stuck with thousands of sheets of paper that have been reinforced with this plastic without prior deacidifying. They have sent it to us to see how on earth they can possibly get the plastic off. I have tried every solvent in our laboratory and none will touch this plastic. Bob has offered to help me determine what the plastic is. When we know what the plastic is, we will be able to find a solvent. That is one of the great services the National Archives provides, by the way.

MR. MAC CLAREN: Do not listen too hard; but if you have a problem, write to me and I will be happy to do my best. I will not do it tomorrow, unless it intrigues me [laughter], but I will try to get to it as quickly as I can. In the only lamination we recognize, using cellulose acetate, we have a sheet of Troya, Manning's tissue; it is a Japanese tissue with a pH of about 7-8. It is a thin, very light, webby material. Underneath it you put cellulose acetate, which is about one mil thick, then your document, deacidified. Another sheet of cellulose acetate and another sheet of Troya are placed over the document. You push them together. In our world we use 500 pounds per square inch for more than thirty seconds and less than one hundred and twenty, at 300° F.

MR. PERRY: Bob told you to write to him, but wisely did not give you his address. I will. It is: Robert MacClaren, Preservation Services Division, National Archives Building, 8th and Pennsylvania Avenues, Washington, D.C. 20408.

QUESTION: If you are visiting in a courthouse in this state, a county official will probably tell you that the records have been laminated. This is as much a political posturing as it is a concern for the records. Are there any technical leaflets that can be sent to county officials in this state which would give them guidelines on how to detect fraudulent processes, when they should laminate and when they should not?

MR. CUNHA: I do not know of any.

MR. NEWMAN: I do not know of any, but have had the same situation in Indiana. I happened to be using a vendor's pad from a Missouri bookbinding company that, among other things, does laminating. Those county officials (clerks, recorders, what have you) have annual meetings. Last week I spoke at the annual meeting of the state clerks' association and, among other things, told them about this particular problem, after having a "discussion" (that nearly came to blows) on the values of lamination with the sales representative. I am not the type of person who can go in and bring a box of candy to the county official or take him out to lunch, which, for some of these people, is the biggest event of the year in some of these very rural counties. But gradually, if you keep hammering away, the message gets through. I felt I had achieved something when one clerk said to me after my talk that if she had any salesperson like that come in, she would call me first to find out if what he was doing was right. One of the people who alerted me to this situation was Virginia Ingrams of the Ohio Historical Society, who had done much research into this area and had discovered a darkening of this commercial lamination (as I refer to it) and also had found an embrittlement of the mylar, which caused it to crack and split. She had a beautiful slide presentation; I know Peter Waters had been after her for quite some time to publish it. Something like that should be published and distributed to all counties of the states.

QUESTION: Is there any possibility of improving the legibility of fading ink? I have in mind particularly the letterpress books that were quite common between 1840 and about 1900, both longhand and typewritten. The print is rapidly fading in many cases; sometimes the writing is not legible. Is there a way to chemically treat the paper or microfilm that will bring up the fading ink?

MR. MAC CLAREN: Where there is some metallic component of the ink (carbon or iron or something of that sort) it is possible, through ultraviolet photography, as indicated this morning, to bring things back to perfect legibility. In the Kennedy Library we have been working with a lot of Jackie's letters to friends, using the pen she used. Some have faded and cannot be read at all. In fact,

they look sort of like a hint of yellow stain on a white card. With double photography and contrast printing we have been able to bring those back photographically to pure legibility. They have required, at times, some retouching, because your background noise is heavy enough so that you build up some fog and it is not as easy a thing as I am indicating. You can do a lot through photography.

QUESTION: Where is the information available on this photography?

MR. MAC CLAREN: About a year away.

QUESTION: I suggest Scott's Photographic Evidence[14] would be okay.

DR. SMITH: It is commonly available in law libraries.

QUESTION: Another place that frequently is helpful is a state crime lab. They will be up on all this evidentiary stuff.

QUESTION: Eastman Kodak has published booklets on infrared and ultraviolet photography.

MR. MAC CLAREN: Do not play with the infrared because you have to refrigerate it and use special focusing devices and it is pretty tricky.

QUESTION: How can one identify durable paper?

MR. MAC CLAREN: We have a double-pronged problem here. One is creating a test that measures permanence. The test that is basically the permanence-measuring tool is the Scribner Test of 1925, a test of the loss in fold value after seventy-two hours at 102° or 103° C. in a dry oven. The Barrow Laboratory did tremendous work in controlled humidity. Dr. Gredminsky of the National Bureau of Standards published an article for us on the effects of humidity on aging. William Wilson did another slightly earlier article, also for us, on the effects of thirty-six years of natural aging. You can get copies of these articles by writing to me. If I were designing a sheet of paper today for a permanent situation, I would go back to the Twelfth Century, buy some sodium silicate, some gelatin, some starch and some rag or woodpulp fiber and make a sheet of paper that would last a thousand years. In the meantime, I do not know anybody making anything that is that good.

MR. PERRY: Enough for the time being. Let us proceed to the hands-on sessions, where the participants will be happy to answer any further questions you may have. [applause]

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14. Charles C. Scott, Photographic Evidence (St. Paul, Minnesota: West Publishing Company, 1969. Revised Edition, 3 volumes).

APPENDIX A

Chapter 68A of the Code of Iowa:
Examination of Public Records

Chapter 68A has been amended since Dr. Harstad delivered his paper. The following is taken from the 1979 Code of Iowa and includes one addition to the eleven categories of confidential records (68A.7) discussed by Dr. Harstad and a minor revision of Section 6 (Penalty).

Referred to in Sec. 93.7, 103A.17, 144.43, 235A.15, 279.16, 279.24, 428A.15, 455B.40, 524.215, 533.60, 692.18

68A.1 Public records defined.
68A.2 Citizen's right to examine.
68A.3 Supervision.
68A.4 Hours when available.
68A.5 Enforcement of rights.
68A.6 Penalty.
68A.7 Confidential records.
68A.8 Injunction to restrain examination.
68A.9 Denial of federal funds.

68A.1 Public records defined. Wherever used in this chapter, "public records" includes all records and documents of or belonging to this state or any county, city, township, school corporation, political subdivision, or tax-supported district in this state, or any branch, department, board, bureau, commission, council, or committee of any of the foregoing. [C71, 73, 75, 77, sec. 68A.1]

68A.2 Citizen's right to examine. Every citizen of Iowa shall have the right to examine all public records and to copy such records, and the news media may publish such records, unless some other provision of the Code expressly limits such right or requires such records to be kept secret or confidential. The right to copy records shall include the right to make photographs or photographic copies while the records are in the possession of the lawful custodian of the records. All rights under this section are in addition to the right to obtain certified copies of records under section 622.46. [C71, 73, 75, 77, sec. 68A.2]

68A.3 Supervision. Such examination and copying shall be done under the supervision of the lawful custodian of the records or his authorized deputy. The lawful custodian may adopt and enforce reasonable rules regarding such work and the protection of the records against damage or disorganization. The lawful custodian shall provide a suitable place for such work, but if it is impracticable to do such work in the office of the lawful custodian, the person desiring to examine or copy shall pay any necessary expenses of providing a place for such work. All expenses of such work shall be paid by the person desiring to examine or copy. The lawful custodian may charge a reasonable fee for the services of the lawful custodian or his authorized deputy in supervising the records during such work. If copy equipment is available at the office of the lawful custodian of any public records, the lawful custodian shall provide any person a reasonable number of copies

of any public record in the custody of the office upon the payment of a fee. The fee for the copying service as determined by the lawful custodian shall not exceed the cost of providing the service. [C71, 73, 75, 77, sec. 68A.3]

68.A4 Hours when available. The rights of citizens under this chapter may be exercised at any time during the customary office hours of the lawful custodian of the records. However, if the lawful custodian does not have customary office hours of at least thirty hours per week, such right may be exercised at any time from nine o'clock a.m. to noon and from one o'clock p.m. to four o'clock p.m. Monday through Friday, excluding legal holidays, unless the citizen exercising such right and the lawful custodian agree on a different time. [C71, 73, 75, 77, sec. 68A.4]

68A.5 Enforcement of rights. The provisions of this chapter and all rights of citizens under this chapter may be enforced by mandamus or injunction, whether or not any other remedy is also available. In the alternative, rights under this chapter also may be enforced by an action for judicial review according to the provisions of the Iowa administrative procedure Act, if the records involved are records of an "agency" as defined in that Act. [C71, 73, 75, 77, sec. 68A.5]

68A.6 Penalty. It shall be unlawful for any person to deny or refuse any citizen of Iowa any right under this chapter, or to cause any such right to be denied or refused. Any person knowingly violating or attempting to violate any provision of this chapter where no other penalty is provided shall be guilty of a simple misdemeanor. [C71, 73, 75, 77, sec. 68A.6; 66GA, ch. 1245(4), sec. 28]

68A.7 Confidential records. The following public records shall be kept confidential, unless otherwise ordered by a court, by the lawful custodian of the records, or by another person duly authorized to release information:

1. Personal information in records regarding a student, prospective student, or former student of the school corporation or educational institution maintaining such records.

2. Hospital records and medical records of the condition, diagnosis, care, or treatment of a patient or former patient, including outpatient.

3. Trade secrets which are recognized and protected as such by law.

4. Records which represent and constitute the work product of an attorney, which are related to litigation or claim made by or against a public body.

5. Peace officers investigative reports, except where disclosure is authorized elsewhere in this Code.

6. Reports to governmental agencies which, if released, would give advantage to competitors and serve no public purpose.

7. Appraisals or appraisal information concerning the purchase of real or personal property for public purposes, prior to public announcement of a project.

8. Iowa development commission information on an industrial prospect with which the commission is currently negotiating.

9. Criminal identification files of law enforcement agencies. However, records of current and prior arrests shall be public records.

10. Personal information in confidential personnel records of the military department of the state.

11. Personal information in confidential personnel records of public bodies including but not limited to cities, boards of supervisors and school districts.

12. Financial statements submitted to the Iowa state commerce commission pursuant to chapter 542 or chapter 543, by or on behalf of a licensed grain dealer or warehouseman or by an applicant for a grain dealer license or warehouse license. [C71, 73, 75, 77, sec. 68A.7; 67GA, ch. 1044, sec. 1] Referred to in sec. 907.4

68A.8 Injunction to restrain examination. In accordance with the rules of civil procedure the district court may grant an injunction restraining the examination (including copying) of a specific public record, if the petition supported by affidavit shows and if the court finds that such examination would clearly not be in the public interest and would substantially and irreparably injure any person or persons. The district court shall take into account the policy of this chapter that free and open examination of public records is generally in the public interest, even though such examination may cause inconvenience or embarrassment to public officials or others. Such injunction shall be subject to the rules of civil procedure except that the court in its discretion may waive bond. Reasonable delay by any person in permitting the examination of a record in order to seek an injunction under this section is not a violation of this chapter, if such person believes in good faith that he is entitled to an injunction restraining the examination of such record. [C71, 73, 75, 77, sec. 68A.8]

68A.9 Denial of federal funds. If it is determined that any provision of this chapter would cause the denial of funds, services or essential information from the United States Government which would otherwise definitely be available to an agency of this state, such provision shall be suspended as to such agency, but only to the extent necessary to prevent denial of such funds, services, or essential information. [C71, 73, 75, 77, sec. 68A.9]

APPENDIX B

Sources of Supplies

Kenmore All-Frostless Refrigerators

Sears Roebuck and Company
Catalog or Sears retail stores

Catalog #46A69791N-White 17.1 cu. ft. model (12.24 cu. ft. refrigerator)

Catalog #46A69591N-White 15.1 cu. ft. model (10.84 cu. ft.)

Catalog #46A69701N-Paint[illegible] 17.0 cu. ft. model (12.24 cu. ft.)

Catalog #46A69401N-Paint[illegible] 14.3 cu. ft. model (10.82 cu. ft.)

Catalog #46A69261N-White 12.0 cu. ft. model (9.40 cu. ft.)

Catalog #46A69921N-White 19.2 cu. ft. model (13.53 cu. ft.)
Electricity saving high efficiency model

Catalog #46A69771N-White 17.0 cu. ft. model (12.27 cu. ft.)
Electricity saving high efficiency model

Cold Storage Rooms

Clifford Finn, Bally Case and Cooler, Inc., Bally, Pennsylvania 19503 215-845-2311

Desiccation Dehumidification Systems and Complete Cold Storage Installations

John McGuiness, Cargocaire Engineering Corporation, 6 Chestnut Street, Amesbury, Massachusetts 01913 617-388-0600

Harris Environmental Systems, Inc., 10 Lowell Avenue, Winchester, Massachusetts 01890 617-729-5100

Print and Negative Storage Sleeves (made of Dupont Mylar-D polyester) and Acid-Free Mount Board

Elaine Haas, TALAS, 130 Fifth Avenue, New York, New York 10011 212-675-0718

Light Impressions Corporation, 131 Gould Street, Rochester, New York 14610 716-271-8960

Kimac 2x2 Cellulose Acetate Slide Protectors

The Kimac Company, 478 Long Hill Road, Guilford, Connecticut 06437 203-453-4690

SAF-T-STOR Slide Page #PV-20 (made of polypropylene)

A. Gill, Franklin Distributors Corporation, Box 320, Denville, New Jersey 07834 201-267-2710

Dial Hygrometers and Thermometers (model HTAB-179)

Abbeon Cal, Inc., 123 Gray Avenue, Santa Barbara, California 93101 805-966-0810

Print, Film and Slide Storage Boxes

The Hollinger Corporation, 3810 South Four Mile Run Drive, Box 6185, Arlington, Virginia 22206 703-671-6600

Conservation Resources International, 1111 North Royal Street, Alexandria, Virginia 22314 703-549-6610

Nielsen Aluminum Frames

Light Impressions Corporation, 131 Gould Street, Rochester, New York 14610 716-271-8960

Westfall Framing, Box 2624, Tallahassee, Florida 32304 904-222-2579

APPENDIX C

Current Color Print Processes

1. Chromogenic Materials

   A. Protected Coupler Types
      Kodak Ektacolor 74 and 78 RC Paper
      Kodak Ektachrome RC Paper 2203
      Fuji Fujicolor Paper
      Fuji Fujichrome Paper

   B. Agfa-type Coupler Materials
      Agfa Agfacolor Paper
      Agfa Agfachrome Paper

2. Silver-Dye Bleach Materials.

      Cibachrome RC Paper
      Cibachrome (polyester support)
      Cibachrome (triacetate support)

3. Dye Imbibition Materials

      Kodak Dye Transfer Prints
      Fuji Dyecolor Prints

4. Diffusion-Transfer Color Materials

      Polaroid Polacolor 2
      Polaroid SX-70
      Kodak PR10 Instant Print Film

5. Pigment Processes

      Fresson Quadrichrome
      Hanfstaengl Tricolor Carbro
      Kwik-Print

APPENDIX D

Recommended Color Print Materials for Collectors/Recommended Limits of Color Print Image Deterioration

1. Recommended Color Print Materials for Collectors

User or Lab Processed
- Cibachrome (non-RC support types only)
- Kodak Dye Transfer (paper support)

Lab Processing only
- Fuji Dyecolor Print (paper support)
- Fresson Quadrichromie (paper support)

Instant Color Photography (if required)
- Polaroid Polacolor 1 (obsolete process)
- Polaroid Polacolor 2 (tentative recommendation)

All of the six materials listed appear to have excellent dark keeping stability, but are subject to light and ultraviolet radiation caused deterioration: prints should be kept in the dark for long-term keeping. Prints used for display purposes should be monitored to prevent deterioration beyond pre-set limits. Fresson Quadrichromie prints appear to have excellent light fading stability and can probably be displayed safely for many years. However, Quadrichromie prints should also be monitored if very long-term display is planned. The recommendation for Polacolor 2 is tentative as dark keeping test data is incomplete.

2. Recommended Limits of Color Print Image Deterioration*

Low Density Stain Formation: Assuming yellow stain formation, not more than .02 blue density increase when measured at D-min. Not more than .02 R-G-B density loss imbalance in the event of D-min density loss.

Overall Density Loss: Not more than 15 percent when measured at D-max and near neutrals of about .30 original density. With some instant color processes, which have a relatively high D-min, it may be necessary to use .40 or .45 instead of .30 near neutrals.

Red-Green-Blue Density Loss Imbalances: Not more than 5 percent when measured at D-max and near neutrals of about .30 original density. With some instant color processes, which have a relatively high D-min, it may be necessary to use .40 or .45 instead of .30 near neutrals. Density loss imbalances may be visually apparent only in large, near neutral, print areas.

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* Recommendations are for critical museum and archive use; other applications may tolerate greater color image deterioration.

APPENDIX E

Storing Color Materials

The following article by Henry Wilhelm is reprinted with his permission from volume 27, number 10, of Industrial Photography, October 1978, pages 32-33, 55-60.

Storing color materials

frost-free refrigerators offer a low-cost solution

HENRY WILHELM

In our August issue, we presented two articles concerning the stability of processed photographic materials. The initial article by David Kach examined the technical basis for the problem and recommended various procedures for insuring maximum image permanence. An accompanying feature by archivist Klaus B. Hendriks discussed the challenge of preserving and restoring historical photographic records. This related article offers photographers and collectors an inexpensive and practical means of humidity-controlled cold-storage aimed at assuring a long-term useful life for historically *and* personally valuable photographic records.

Use of a modern frost-free refrigerator/freezer is the only simple way to store color materials at low temperature and humidity levels without the use of vapor proof packaging. The refrigerator compartment of such a combination refrigerator/freezer can maintain a temperature of about 1.5°C (35°C), and relative humidity levels between 25 and 35 percent all year around, regardless of the ambient humidity and temperature levels. Relative humidity of 25 to 30 percent is currently suggested as the "ideal" level for photograph storage.

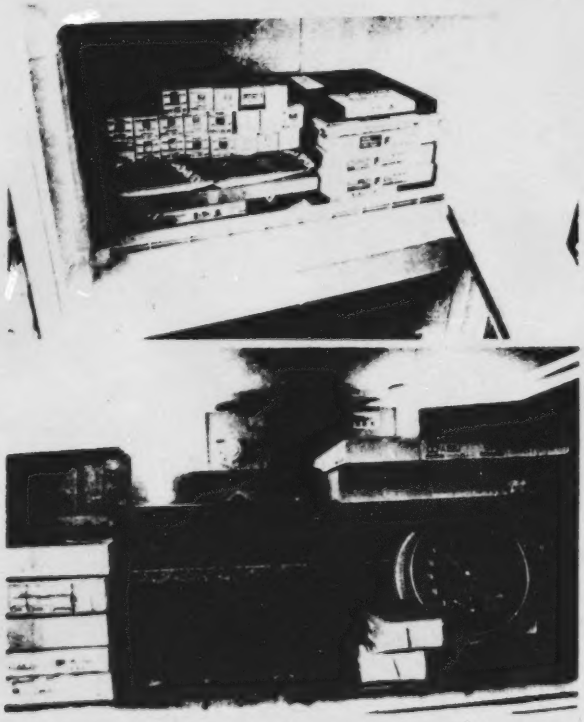
Materials stored in the refrigerator will be readily accessible, requiring only that they be placed in a polyethylene bag immediately upon being removed from the refrigerator to prevent moisture condensation.

Research for this project was, to the author's knowledge, the first investigation of the use of low cost, frost-free home refrigerators for storage of color photographs without the need for vapor protection. Because the author has not had the opportunity to examine nearly all the makes of frost-free refrigerators on the market, discussions will be limited to general observations on the various types of refrigerators presently being sold, and give specific data on a frost-free refrigerator sold by Sears Roebuck that is now being used to store the color photograph collection of East Street Gallery.

Many other brands will maintain adequate temperature and humidity levels. However, due caution should be exercised in selecting a refrigerator for photograph storage. Many advertised as "frost-free," notably the "cycle-defrost" types and those having "frost-free" refrigerator compartments but manual defrost freezer sections, will maintain very high levels of humidity and quickly ruin unprotected photographs. None of the older manual defrost refrigerators can be used for unprotected photograph storage, as they normally have humidity levels between 90 and 100 percent.

With the frost-free units recommended here, only the refrigerator compartment can be used for unprotected storage. The freezer compartment has high humidity levels, especially during the daily automatic defrost periods. By the same token, "frost-free" freezers, which have no refrigerator compartments, cannot be used for unprotected storage of photographs.

The operating principle of a low humidity, frost-free combination refrigerator/freezer is fairly simple: Air is cooled in the



(Top) Freezer compartment containing factory packed materials in vapor proof packaging. (Above) Refrigerator shelf (with hygrometer) arranged for air flow containing processed and unprocessed photographic materials.

Cautions When Using A Frost-Free Refrigerator For Photograph Storage

1) Be absolutely certain you have proper type of frost-free refrigerator/freezer combination unit. Test humidity level of unit under operating conditions prior to placing photographs in it for storage. Continue to check humidity for a period of several weeks.
2) Use only the refrigerator compartment (not freezer section) for unprotected storage of photographs.
3) Photographs should be placed inside cardboard boxes (transparencies may be kept in original slide boxes made of cardboard or plastic as supplied by processor) to protect photographs from humidity peaks which occur when refrigerator door is opened or after defrost cycle.
4) Photographs in their boxes should immediately be placed in a plastic bag upon removal from refrigerator to prevent moisture from condensing on them while they are warmed up to room temperature.
5) Avoid opening refrigerator door more often than necessary.
6) In event of power failure of up to 48 hours (2 days) duration do NOT open refrigerator door.
7) In event of power failure of longer than 48 hours it is best to open refrigerator door and leave open until power is restored.

freezer section by coils which are about -29°C (about -20°F). Most of the moisture in the air is condensed on the coils in the form of ice crystals at this very low temperature. The air, forced by a fan, is then circulated throughout the freezer compartment and warms up to about -18°C (0°F). From there it goes into the refrigerator compartment where it warms up to 1.5°C (35°F). Because the air warms up from the original low temperature of the cooling coils, the relative humidity drops to between 25 and 35 percent. This "temperature rise-humidity drop" effect takes place only in refrigerators which have the design features listed in the accompanying box.

A type of refrigerator often confused with the true "frost-free" design is that known as the "cycle-defrost" refrigerator. These are generally advertised as having frost-free refrigerator sections, but manual defrost freezer sections. These work by having separate cooling coils attached to a thin aluminum plate in the refrigerator section.

When the unit operates, the coils and plate form a small amount of frost. Between running cycles, the plate rapidly warms up to the temperature of the refrigerator compartment, which is above freezing, and the melted frost is drained off. These units use much less electricity than a true frost-free unit and are often advertised as being "energy saving." They ARE NOT suitable for unprotected photograph storage because they have a very high level of humidity. An older design based on a similar principle had cooling coils located behind the walls of the refrigerator section that were so arranged that they never reached a temperature below freezing. The interior walls of such a refrigerator are usually wet with condensed moisture and the humidity level is normally near 100 percent.

Most color materials will suffer serious fading and shifts in color balance over a period of years if stored in the dark at normal room temperatures and humidities—even if the areas are air conditioned during the warm and humid summer months. In their publication E-36 on Vericolor II negative color film, Kodak states: "Storage at a temperature of 21°C (70°F) with a relative humidity (RH) not exceeding 40 percent is considered satisfactory for properly processed Vericolor II negatives that are intended to produce satisfactory prints for a period of two to five years. Negatives that are stored in a refrigerator at 1.5°C (35°F) should be expected to retain satisfactory reprinting characteristics for at least ten times longer than those stored at room temperature (21°C). Storage of negatives in a freezer at -18 to -23°C (0 to -10°F) should provide maximum stability of the dye images, enabling properly processed negatives to print satisfactorily for very long, indefinite periods of time. When stored at these low temperatures, the negatives must be protected to maintain the proper moisture content."

Typical Kodak incorporated coupler transparency films, such as Ektachrome Process E-4 or Process E-6, which might be expected to show a noticeable fading (about ten percent) or color shift in about ten to 20 years time in uncontrolled room storage, may be expected to last 100 years or more in a frost-free refrigerator before the same amount of deterioration is evident. Kodachrome films or Cibachrome prints might last as long as 800 years in refrigerated storage.

Henry Wilhelm is a researcher and head of East Street Gallery, a manufacturer of archival processing equipment. This article is excepted from his forthcoming book, Preservation of Contemporary Photography Materials, *to be published in December by East Street Gallery, Grinnel IA 50112.* *Copyright 1978 by Henry Wilhelm*

APPROXIMATE WARM UP TIMES FOR VARIOUS TYPES OF PACKAGES

Type of Package	Warm Up Times To Room Temperature [20°C - 68°F] From 0°C to 20°C (From 32°F to 68°F) 20°C Temp. Rise (36°F Temp. Rise)	From -20°C to 20°C (From -4°F to 68°F) 40°C Temp. Rise (72°F Temp. Rise)
36 exp. box of slides in Kodak paper box	40 min	1 hour
Envelope with 6 strips of 6 exp. 35mm film in polyester or acetate sleeves inside	10 min	15 min
35mm reel of film in metal film can	3 hours	4 hours
16mm reel of film metal film can	1½ hours	2 hours
10 paper prints in flat cardboard box	1 hour	1½ hours
100 paper prints in flat cardboard box	3 hours	4 hours

Above approximate warm up times are for single containers of the types mentioned wrapped in a single layer polyethylene bag to prevent moisture condensation and placed on a table so air can circulate freely around the container. Do not stack containers together during the warm up period unless greatly increased warm up times are used.

For the photographers, this means that the use of the refrigerator for storage will prevent serious deterioration of color photographs during his or her lifetime, provided the films are not mishandled or projected in a slide projector when they are out of the refrigerator. For both the photographer and the collecting institution, this will ensure that valuable color materials can be preserved until such time as "permanent" color materials or processes are available, and the older unstable photographs can be copied onto this new medium.

Prints made on Ektacolor 74 RC Paper and Ektachrome RC Paper, Type 1993, which may be expected to show significant deterioration under typical conditions of dark storage in less than ten years, may be preserved for at least 100 years if kept in the refrigerator except for occasional viewing or short term display.

Protected storage

Old style refrigerators, which have to be manually defrosted from time to time, do of course maintain a low temperature, but the humidity level of this type of unit will generally be between 90 and 100 percent. At this relative humidity, films will stick together, fungus will grow on the film emulsions and cardboard slide mounts, and there will be moisture-caused deterioration (hydrolysis) of the color dyes.

Photographs stored unprotected in a standard refrigerator will be destroyed in a short period of time.

If it is necessary to store photographs in a standard refrigerator, they must be preconditioned to a low humidity and then sealed in a true vapor proof container, such as a properly capped glass bottle or a metal foil/plastic laminated pouch that can be heat sealed. Virtually all types of plastics will absorb and transmit moisture over a period of time and are thus NOT SUITABLE for moisture protection of photographs in cold storage.

Kodak recently made available a foil/polyethylene/paper laminated pouch that may be heat sealed with a commercial heat sealing unit or an electric (dry) household iron at a temperature between 120-150°C (250-300°F), which is usually near the "cotton" setting of the iron. These pouches are similar to those used to factory pack sheet films, and are available in 4x5 and 8x10-inch sizes. They are called Kodak Storage Envelopes for Processed Film, and may be ordered through Kodak dealers.

The author strongly recommends against the use of any high-humidity cold storage unit for storing valuable photographs, even if the photographs are in hermetically sealed containers. There is the constant risk of the containers failing, and in the case of pouches, they may be punctured in handling, causing pinholes which are not readily visible. Metal motion picture cans may be taped shut; however, the adhesive tapes generally used for this purpose give poor protection against vapor transmission. With film cans, there is the risk that a particular can may not be properly taped, or that the can will rust during long term storage. Any system which requires vapor proof containers will reduce accessibility to the photographs, increase costs, and probably require trained personnel to properly pre-condition and seal the film containers. There will always be the possibility of a container failing because of manufacturing fault, improper sealing or damage in handling, thus destroying photographs which can never be replaced.

A final objection to uncontrolled humidity, refrigerated storage is that the photograph containers will actually become wet with condensed moisture or covered with ice if the temperature is below freezing. This creates a very messy situation and makes identification of the containers difficult. At above freezing conditions, mold and slime may form on the containers.

Available equipment

Commercial equipment is available for maintaining low humidity conditions at low temperatures for virtually any size storage facility. Frost-free refrigerators have sufficient capacity for home and small commercial and museum use.

East Street Gallery has been using a Kenmore Frostless refrigerator/freezer for storage of color materials. This unit is Model No. 69511, sold by Sears Roebuck & Company. In the 1978 Sears Fall/Winter catalog, the unit sells for $369.96. It is equipped with a "Power Miser" control that may be used to shut off external electric wall heaters during times of the year when the relative humidity is low. The heaters prevent moisture from condensing on the slightly cooled exterior surface of the refrigerator during periods of high air relative humidity. The heaters are not necessary during the winter months when the relative humidity indoors is low in most areas of the country.

This model has a 10.8 cubic foot refrigerator section capacity which we calculate will contain about 20,000 transparencies mounted in standard 35mm cardboard mounts, a figure based on the transparencies being packed in standard Kodak 36 exposure cardboard slide boxes with a reasonable amount of care in orderly packing. The 20,000 transparency capacity leaves sufficient air space between the groups of boxes so that the air may circulate freely throughout the refrigerator compartment.

The Model 69511 has two controls located inside the refrigerator compartment. For storing color photographs, the Cold Control should be set on the No. 5 position (Coldest), and the Usage Control should be set on position C (Heavier Refrigerator Usage). These control settings will allow the maximum amount of cold dehumidified air to enter the refrigerator compartment, and will typically produce temperatures of −4 to −1°C (25-30°F) at about 30 percent relative humidity. A third control, marked Power Miser, was discussed earlier, and has no influence on conditions inside the refrigerator.

This Kenmore refrigerator/freezer has the cooling coils located behind a metal wall in the upper freezer compartment. A fan located in front of the cooling coils circulates cold air from the coils into the refrigerator and freezer compartments, and runs only when the unit's compressor is running, at which time the cooling coils are about −29°C (−20°F). Moisture in the air is condensed on the coils in the form of ice crystals as it passes over them. When the compressor is not running, the temperature of the cooling coils rises to about that of the freezer compartment (−18°C or 0°F) and some of the ice on the coils evaporates directly to water vapor, gradually raising the relative humidity in the freezer compartment to about 90 percent. As the moist but very cold air from the freezer compartment enters the refrigerator compartment, it warms up to about 1.5°C (35°F). In doing so, the capacity of the air to contain moisture greatly increases, thereby dropping the relative humidity of the air to about 25 or 30 percent. This is, however, a very low humidity for food storage and is one of the "problems" of a frost-free refrigerator, according to the manufacturers. At this low level of humidity, food will rapidly dry out unless properly wrapped.

As the cooling coils condense moisture out of the air, they become covered with ice, which must be removed from time to time, or the coils will become clogged and the fan-forced air will not pass through the coils. To accomplish removal of the ice, frost-free refrigerators have "defrost cycle," during which time the compressor is shut off and an electric heater located

Design Features

1) Unit must have separate refrigerator and freezer compartments. Compartments have separate doors and may be side-by-side or one on top of the other.
2) Cooling coils are located ONLY in freezer compartment.
3) Cooling coils are located in isolated compartment in freezer section and cannot be seen without disassembling the unit. No part of the freezer or refrigerator which forms ice crystals can be seen.
4) Air is forced over the coils and into the freezer compartment by a fan. The fan will make noise when running and a blast of air will be noted coming out of one or more ducts in the freezer and refrigerator sections.
5) This is the most important design feature: ALL cooling in the refrigerator section comes from cold air blown in from the freezer section by a fan.

under the coils melts the ice. The water formed during this process is collected in a trough and runs through a pipe to an "evaporator" pan located near the compressor in the bottom of the unit.

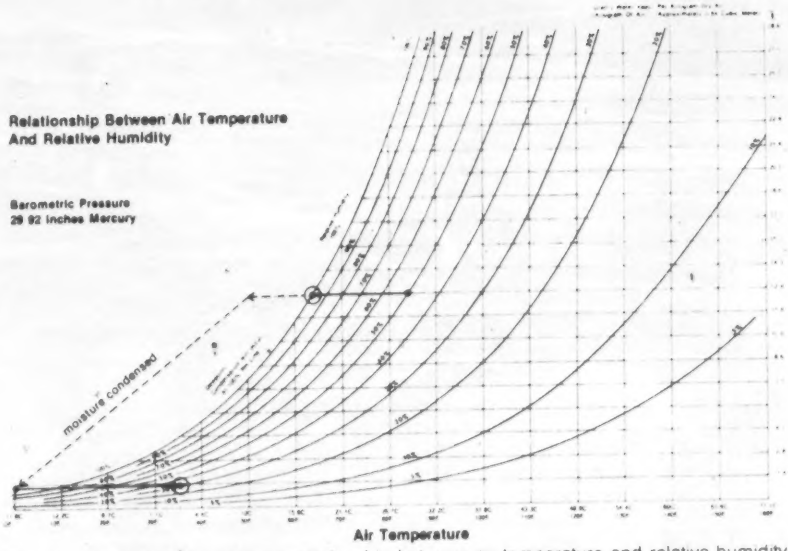
Films and prints should NOT be stored in the freezer compartment of a frost-free unit unless they are sealed in vapor proof containers and these placed in an insulating box (several thicknesses of cardboard, etc.) During the defrost cycle, the interior temperature of the freezer compartment will rapidly rise from about −18°C (0°F) up to 21°C (70°F) or above. The humidity level also reaches near 100 percent during this period. The freezer section may be useful for storage of factory packed unexposed film and paper, which should be placed in an insulating box within the freezer section to prevent the abrupt temperature changes from affecting the film and paper.

The temperature and humidity levels in the refrigerator compartment stay fairly constant during the defrost period, though there will be a humidity rise for about 15 minutes after the cooling cycle and blower start. This short humidity rise will not affect stored materials if they are in almost any sort of box or bag. The author's tests show that this humidity peak in the refrigerator section is of such short duration that even a single thickness of paper wrapped around a box of slides will prevent more than a couple of percentage points of humidity rise. The slide box itself offers adequate protection for the slides during this short humidity peak, so no additional packing is needed. The temperature of the refrigerator compartment stays nearly constant during and after the defrost cycle, provided the door isn't opened during the cycle.

Cautions

Frost-free refrigerators use a great deal more electrical energy than do standard refrigerators—on the average three or four times as much. Most of the refrigerators on the market today, both frost-free and conventional types, are poorly insulated. The current fashion of "thin-wall" refrigerators, even with low loss plastic foam insulation, results in excessive heat transfer, which increases operating costs. The high heat transfer also requires that electrical "anti-condensation" heaters (resistance heater wires located next to the outside walls of the refrigerator) be operated with much higher current levels than would be necessary if more insulation were used. The Sears Roebuck refrigerator/freezer, which is recommended here, is no exception to the typical poorly insulated design of modern refrigerators.

The author does NOT recommend that color materials be stored in a refrigerator that also contains food items, as the food will give off a wide variety of chemicals and water vapor. There is also the very real danger of getting food, oils, etc., physically on the photographs or storage boxes. Small amounts of color films may be stored in a refrigerator containing food by sealing the films in a glass bottle or Kodak foil storage pouches.



Psychometric chart illustrates the relationship between air temperature and relative humidity (RH) based upon the air's capacity to retain water vapor. Lower heavy line demonstrates how the RH of air at 0°F drops from 100 to 30% when blown into an area with 35°F temperature levels.

While many frost-free refrigerator/freezers should be suitable for photograph storage, the author feels the previously described Sears unit is a good choice as it is available throughout the U.S. It is also one of the lowest cost units of this type on the market.

Testing necessary

The operating characteristics of ANY unit must be known before any valuable photographs are stored in it. THIS PRIOR TESTING IS ABSOLUTELY NECESSARY. It is especially important that a unit be tested for humidity level from time to time during the summer months to be certain excessive humidity levels don't develop. For instance, a standard manual defrost refrigerator with no food in it may, for a time, test an acceptable level of humidity during the winter months because of the very low indoor humidity in most buildings when the outdoor temperature is low. But this type of unit will rapidly rise to humidity levels near 100 percent when spring arrives, thus destroying any photographs stored within.

Until a unit has been used for some weeks in the summer, a hygrometer should be stored inside the refrigerator compartment so it may be checked each time the door is opened, keeping in mind that there will be a short time of high humidity after each defrost cycle. When purchasing a unit, make certain it is a true frost-free model, with *both* the refrigerator and freezer compartments guaranteed frost-free. Then check it with a hygrometer to make certain it is satisfactory.

Refrigerators and freezers should be located in a well ventilated location—never in a closet or other small enclosed room. As mentioned earlier, a refrigerator—especially a frost-free model—gives off considerable heat because of the defrosting heater and the anti-condensation heating wires built into the refrigerator wall.

Low-humidity refrigerated storage is also a necessity in tropical or other areas that normally have relative humidities of higher than 60 percent not only to protect the photographs from excessive heat, but also from the high humidity which will in time cause fungus growths to destroy the films. In such areas, black and white negatives and prints must also be stored in low humidity conditions.

The cost of the refrigerator will be small when compared to the value of the film and processing costs of the photographs stored in it. The cost of 50 or 60 rolls of processed 35mm color film may equal that of the refrigerator. Photographs of personal, artistic or historical importance must be considered priceless, as once they are damaged or destroyed, they generally can never be replaced. A commercial photographer should consider the sales possibilities of reprints in future years from photographs that have been properly stored. There will also be considerable time saved in making reprints from even fairly recent photographs, as the filter packs and exposure times will not have changed significantly from those of the original prints. □